

## University of Dundee

### DiCER

Gault, Paul; Masthoff, Judith; Johnson, Graham

*Published in:*  
International Journal of Human-Computer Studies

*DOI:*  
[10.1016/j.ijhcs.2015.03.001](https://doi.org/10.1016/j.ijhcs.2015.03.001)

*Publication date:*  
2015

*Licence:*  
CC BY-NC-ND

*Document Version*  
Peer reviewed version

[Link to publication in Discovery Research Portal](#)

*Citation for published version (APA):*  
Gault, P., Masthoff, J., & Johnson, G. (2015). DiCER: A distributed consumer experience research method for use in public spaces. *International Journal of Human-Computer Studies*, 81, 49-71.  
<https://doi.org/10.1016/j.ijhcs.2015.03.001>

#### General rights

Copyright and moral rights for the publications made accessible in Discovery Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from Discovery Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain.
- You may freely distribute the URL identifying the publication in the public portal.

#### Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

# **DiCER: A Distributed Consumer Experience Research Method for Use in Public Spaces**

**Paul Gault <sup>1</sup>, Judith Masthoff <sup>1</sup> and Graham Johnson <sup>2</sup>**

*<sup>1</sup> University of Aberdeen, <sup>2</sup> NCR*

## ***Corresponding Author's Contact Information:***

Paul Gault

Dot.Rural, MacRobert Building, University of Aberdeen, Aberdeen, UK

Phone: (00)441224-274584

Email: p.gault@abdn.ac.uk

## ABSTRACT

This paper presents research into new ways in which organisations can gather field-based consumer insight particularly in public spaces. In an increasingly complex and fast moving business world, there is a need for quicker and more efficient consumer experience research that also provides a wider focus on the situation under investigation as required when studying urban spaces. The paper presents a method called DiCER for using large groups of non-specialists (i.e non-ethnographers) to make fieldwork observations working in a transdisciplinary setting with ethnographers and designers. In this method, groups of people are given a small amount of training and provided with support materials that allow them to make and report observations. The method provides a way of harnessing the potential of an organisation's staff for a shared goal of generating useful fieldwork material.

The method was first tried out in two studies that investigated how collaborative activity could be facilitated in large public spaces. This helped identify issues related to the design of support materials whilst conducting fieldwork and explored ways of analysing and presenting the results of such activity. A follow-up study observed the activity of conversations between strangers waiting in a railway station concourse. The aim of this was to test both the method on a more focused problem and prototype tools to support recording observations in such a context. The outcomes were prototypes and interventions demonstrating potential techniques for gathering fieldwork material.

A final study explored the potential of using a group of non-specialist employees distributed across an organisation to fulfil parts of a fieldwork project. This guided the development of training sessions for people with little prior knowledge of doing fieldwork. The main output was design recommendations for further applications of the method in a similar context.

**Keywords:** consumer experience, public spaces, research method, transdisciplinarity, urban computing, design ethnography

# 1 INTRODUCTION

Understanding people, their behaviour and experience of products, systems and services is a key element of any design and business activity. Such knowledge can ensure the design of new and the improvement of existing technology-orientated experiences is appropriate for their intended audience. A designer is most effective when they have deep knowledge of the context where the end product or service is going to be used (Press and Cooper 2003). The early stages of concept generation allow designers to exploit their intuitive knowledge and creative ability to generate a wide array of solutions. Later in the design process, more constraints on the physical, organisational and production criteria restrict the design ideas. The early phase of the process therefore allows the designer to be at their most divergent and innovative (Laurel 2003). Linking together the outputs of consumer experience research with the earlier phases of the designers' activity has the most potential to influence concepts as they are developed (Frohlich and Prabhu 2003).

However, there are two key challenges that need to be overcome. The first is how to acquire a clear consumer understanding through in-depth qualitative research without investing huge amounts of resources. The second challenge is how to communicate the results of such endeavours in a form that can be exploited by designers and other stakeholders. These challenges become even more pronounced when designing technology for use in public and shared urban environments, as the people research will need to be broad and holistic in nature and be conducted in “in the wild”, in real-life urban settings rather than in a traditional laboratory.

This paper presents a new method that enables quick and cost-effective qualitative user research. It uses and adapts techniques from the field of design ethnography to understand people's experiences when products and services are destined for use in a public setting. It is claimed the method makes it easier to do transdisciplinary research, showing how ethnographers, designers and non-experts from various backgrounds can work together in a transdisciplinary way, i.e. moving across and beyond traditional disciplinary boundaries (Nicolescu 2010). Our paper describes how

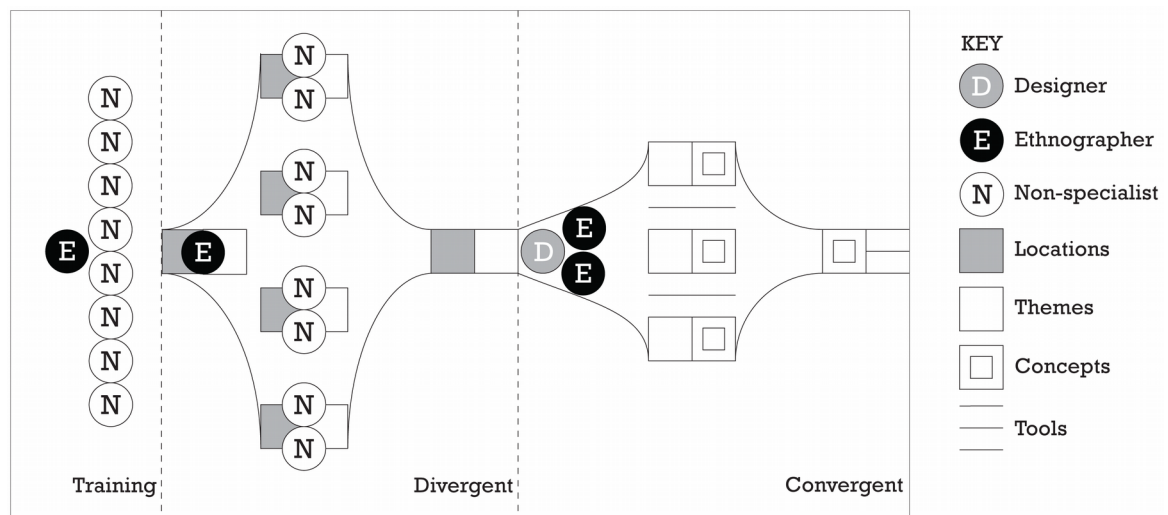
the DiCER method was developed, refined and then its effectiveness validated through studies in public space settings. The following section gives an overview of the method and its three phases: a training phase, a divergent phase and a convergent phase.

## 2 METHOD OVERVIEW

The **DI**stributed **C**onsumer **E**xperience **R**esearch (DiCER) method has been developed to support organisations gain an understanding of the end-users of their products, systems and services, particularly when these need to be deployed in public spaces. The title begins with 'Distributed' as an important part of the method is the involvement of many non-specialist fieldworkers. The focus is on the 'Consumer' rather than 'Customer' as the method has been developed in the context of a business-to-business organisation where referring to customers can frequently mean other companies. The 'Experience Research' element of the title reflects the key outcome - to deliver an understanding of the behaviour of people and their use of technology. There has been increasingly more emphasis placed on creating positive user experience in recent years (McCarthy and Wright 2004; Hassenzahl 2008) with the importance recognised of large organisations integrating this aspect into the development of products, systems and services (Day et al. 2010).

The DiCER method supports the transdisciplinary collaboration between ethnographers, designers and non-specialist fieldworkers within a large organisation. The method is made up of three phases (see Fig. 1): a training phase, a divergent phase and a convergent phase.

The *training phase* involves the training of many potential fieldworkers who will gather material to inform the consumer experience research process. The focus is initially set by an experienced ethnographer and defined through the early involvement of designers. The ethnographer is responsible for equipping the fieldworkers, who are expected to have no prior experience of fieldwork, with the necessary knowledge to engage in field based research activity.



**Fig. 1.** DiCER Method Overview

The *divergent phase* sets out a range of related themes and suitable locations to situate those themes for the fieldwork to take place. Multiple teams can work on each theme to explore different perspectives on or interpretations of the same research question. The amount of time for the fieldwork can be as little as a half-day of very intense activity to gather as much material as possible. Following the fieldwork, a workshop helps sort through and understand the material that has been gathered. This workshop also offers an opportunity to reflect upon the experience of making observations. The goal is to define a more focused problem for a longer period of deeper fieldwork.

The *convergent phase* explores the problem defined through the earlier phase in much greater detail. In this phase, two experienced ethnographers work closely with a designer. This is an important collaboration as the complimentary skills they each offer have the potential to generate innovative tools and techniques for conducting the field research. The amount of time for fieldwork in this phase is typically longer (two weeks or more) as it requires multiple visits to the field locations to understand how they are used at different times of day. A further analysis workshop involving the ethnographers and designer brings together new themes with design concepts that address the problem in question. These themes are used to evaluate the design concepts and provide a rationale to decide which to take forward for prototyping. Iteration at this stage facilitates dialogue between the designer and ethnographers.

### **3 RELATED WORK**

#### **3.1 Design Ethnography**

Design ethnography involves the use of techniques from anthropology to provide businesses with deep knowledge about their consumers and their daily life to improve the probability of success for a new product or service (Salvador, Bell, and Anderson 1999). Design ethnography is different from design research as a non-designer can apply it. Although design research is capable of providing insights to inform the designer's process, this frequently sits as part of the larger goal of producing a new product, system or service (Hanington 2003). Due to this, it does not offer as much depth as a solely research focussed effort may be able to provide. Design ethnography, on the other hand, is weighted towards the research outcomes first, then seeks to make these actionable as part of a wider design strategy.

Design ethnography makes use of the many theories, practices and approaches of anthropology along with other social-sciences disciplines such as sociology, psychology and communications. Its basis is on seeking to understand what people do, say and think (Salvador, Bell, and Anderson 1999). It does not just aim to ask consumers what they want but instead strives to gain an understanding of how they live their lives. The underlying assumption is that people are not just consumers but social beings with wishes, desires, wants and needs that are either unarticulated and/or unrecognised.

Fieldwork and participant observation are central to the efforts of a Design Ethnographer. A key difference with traditional anthropological research is the compressed time frame that work must be completed within. Throughout her career, an anthropologist such as Margaret Mead was able to take twelve journeys back to her field site across many decades (Bowman-Kruhm 2003) whereas in design ethnography, business demands and time act as continual constraints.

Ethnography is part of the complicated and changing role that social sciences has evolved into in the twenty-first century (Hammersley and Atkinson 2007). Although a core definition of

ethnography can be made, it cannot have a single standard meaning as it changes in different contexts. The ability to use a range of methodologies and shift according to new environments enables design ethnography to be applied in many different market places.

In many corporations, understanding the end user has become a key strategy for management (Hunt 2011). This can be seen through the adoption of user-centred methods in business by putting the requirements of the end-user at the forefront of developing new products and services.

A traditional ethnographer acts as a type of translator when studying other cultures so a design ethnographer must also act as a translator in the corporate setting. Design ethnography both as it is practiced and through the knowledge it generates can provide designers and engineers with a common language where experiences and critical life behaviours can be discussed (Salvador, Bell, and Anderson 1999).

The purpose of carrying out design ethnography is to drive innovation of products, systems and services. This equips designers with deep knowledge about end users that can generate further dialogue to inform development. Suri discusses the role of the designers as being responsible for creating a world with meaning (Suri 2011). Designers are no longer concerned with simply creating products but rather operate in the knowledge transfer business (Leinbach 2002). This views design as a service that generates and transfers knowledge. As researchers create value with new knowledge, Leinbach proposes that, instead of tangible products, designers should seek to create intellectual property. This aligns with the emerging shift of theories on innovation, away from the concept of the isolated genius and towards an understanding of the social processes involved in creativity (Johnson 2010).

Design innovation can be driven by understanding the needs of those who use a product or service the most (von Hippel 1989), but there is a need for toolkits to help bring such users into the design process (E von Hippel and Katz 2002). This can be created through opening up the development process to enable further user participation.



## 3.2 Experience Research Methods

There are a variety of potential methods that can be used for providing a deep understanding of consumer experience, drawn from the fields of market and design research.

### 3.2.1 Ethnographic Observations

The method of ethnographic observation (Simonsen and Kensing 1997) is aligned with a design approach and involves observing people in their own environment to document their lived experience. There tends to be a very high threshold to conducting this kind of activity as it requires a lot of background knowledge to help frame the research questions (Agar 1996), a deep understanding of different cultures (Salvador, Bell, and Anderson 1999) and an ability to analyse the material to identify emerging patterns (Strauss 1998). The preparation time is also a burden as access to participants and their context needs to be negotiated and participants who are willing to be observed must be recruited (Hammersley and Atkinson 2007). The amount of time it takes to carry out observations is very long as it can take a while to collect enough evidence to show patterns in behaviour rather than one-off instances. Researchers in the field of human computer interaction use ‘in the wild’ ethnographic research, for example to inform ubiquitous computing (Crabtree et al. 2006). Ethnographic immersion has previously been used in public settings to support user experience design, for example (Seeburger, Foth, and Tjondronegoro 2012).

Rapid ethnography is able to offer field practices that enable researchers to better understand users, their environments and the interaction between the two within a shortened timeframe (Millen 2000). There is a great amount of depth that can be achieved using this method as it generates a large amount of material that can be compared and contrasted with other participants (Hughes, Randall, and Shapiro 1992). However, it often has low breadth as the investigation is focussed on a single person or small group in a very specific context.

### **3.2.2 Contextual Design**

Contextual design (Beyer 1998) is a user-centred design process that makes use of ethnographic methods to help generate relevant field data. It is commonly used in the workplace to help rationalize workflows and support the design of human-computer interfaces. The amount of preparation and task time it requires can be shortened through integration within an Agile workflow (Beyer, Holtzblatt, and Baker 2004). The depth it delivers is high but is dependent on how many people have participated in the field research activity (Chamberlain, Crabtree, and Davies 2013) whilst the breadth it provides is low as it is limited to a particular field setting and group of users.

### **3.2.3 Interviews**

Interviews (Spradley 1979) are a technique for asking predefined, open questions to illicit verbal responses from the participant regarding their opinions on predefined topics. This approach is widely used to gain qualitative responses to gain further understanding. Whilst it is straightforward to carry out, it can be challenging to form the questions to be asked and to develop a good rapport with participants (Wood 1997). The task time is often high as an interviewer holds a long conversation with the participant with further time required to transcribe or write-up any recordings. Interviews can often produce a great amount of depth as it gives the participant an opportunity to engage in a discussion regarding their responses (Lincoln 1985). The breadth an interview can provide heavily depends on the types of questions asked and how willing a participant is to contribute. User experience designers have also started doing ‘in the wild’ interviews within public spaces, for example to support the design of media façades (Wiethoff and Gehring 2012).

### **3.2.4 Surveys**

Surveys are a method of understanding the opinions of a representative and sufficiently large group of people through asking questions and (in the main but not exclusively) quantifying their responses to these questions. There is a low threshold to creating a survey, as it requires a little background knowledge to create, distribute, collect and analyse the material (Evans and Mathur

2005). Preparation time is high, as the questions need to be carefully worded. Task time is low as it involves the participants working through questions and providing answers using multiple choice or brief sentences of text (Kanuk and Berenson 1975). Also, a survey can be distributed to a large audience without necessarily having a researcher present. The depth offered by a survey is often very low as it can only provide material based around a preset framework of questions (Linsky 1975). The breadth a survey can offer is very great as it can be distributed to a very large number of participants with minimal cost (Deutskens et al. 2004).

### **3.2.5 Focus Groups**

Focus groups (Krueger 2009) are a tool of market research, also used in design, to help understand views of a preselected group of people using discussion with a facilitator posing the questions and prompting the topics. There is a low threshold to holding a focus group session, as it is an easy approach for eliciting the views of a small group of people (Smithson 2000). Additionally, preparation time is low because it only requires questions or topics to be defined in advance of the focus group session (Calder 1977). The time it takes for a focus group session to be held is also low as it is possible to listen to the opinions of a small group of people in a short space of time (Fern 1982). A focus group offers little depth as it only allows for surface level discussion, as there are so many people involved (Litosseliti 2003). However, the breadth provided is high as it can convey a wide amount of different perspectives across many topics and contexts (Nielsen 1997).

### **3.2.6 Participatory Design**

A participatory design method (Muller 2003) calls for the people being designed for to be involved throughout the design process from generating the initial concepts to evaluating the appropriateness of final designs. This approach has roots in design as a way to understand needs and desires of the end-user (Sleeswijk Visser, Van der Lugt, and Stappers 2007). There is a very high threshold to facilitating a participatory design session, as it requires a deep understanding of

the appropriate tools and materials to be delivered effectively (Grudin 1993). Preparation given to a participatory design task is high as is the task time itself as it seeks an engagement with individual participants for them to construct their own designs and then translate these into useful design recommendations (Sanders et al. 2010). The depth offered is typically very high as the generative nature of the activity helps to draw out innate needs and issues that may otherwise be difficult to articulate (Sanders 2002). The breadth of this approach is limited as it can only involve a small number of people in an individual session.

### **3.2.7 Interventions**

An intervention is a design-based approach that places an installation in the familiar environment of the user to provoke a response (Miles and Hall 2005). There is a low threshold to carrying out this activity as it can be deployed by a designer who wishes to explore a particular topic in the every-day context of the people being designed for (Klanten and Hubner 2010). There needs to be careful consideration of the users and their environment before installing an intervention, so the preparation time is high. The task time for an intervention is also very high, as it requires a lot of effort to create, install and observe any effects it has (Dalsgaard, Dindler, and Halskov 2011). The depth offered might be considerable although this really depends on how well the intervention is designed and on how much the participants actually engage with it (Gaver, Dunne, and Pacenti 1999). The breadth an intervention can offer is unclear as it only provides an opportunity to gain the opinions of the people who encounter it.

### **3.2.8 Desired Characteristics of New Method**

Based on the summary of the above presented in Table 1, what is missing is a method that is quick to do, with a low threshold, but also providing both breadth and depth. This conclusion leads to the desired characteristics of the method being developed, as indicated in the table's bottom row.

<b>Method</b>	<b>Threshold</b>	<b>Prep Time</b>	<b>Task Time</b>	<b>Depth</b>	<b>Breadth</b>
Ethnographic Observations	++	++	++	++	--
Contextual Design	++	+	+	+	-
Interviewing	+	+	+	+	?
Surveys	-	+	-	--	++
Focus Groups	-	-	-	--	+
Participatory Design	++	+	+	++	-
Interventions	-	+	++	?	?
<b>Desired Method</b>	--	--	+	+	++

**Table 1.** Summary of method characteristics and desired characteristics. ++ means very high, + high, - low, -- very low and ? uncertain.

Ethnographic observations will be taken as a starting point for the new method as it has potential to offer a very high amount of depth when understanding the consumer experience as it provides an understanding of people in their own environment based on actual behaviour. The barriers to this approach such as a very high threshold and preparation time can be overcome if these tasks are undertaken by an experienced ethnographer to help facilitate the participation of additional observers. Available frameworks to help support observations are discussed next.

### 3.3 Observation Frameworks

We considered six popular frameworks from the field of ethnography to use in the method. The 9 Dimensions framework (Spradley 1980) offers a comprehensive framework to document observations with many different characteristics although some elements might be too specific and difficult to intuit whilst in situ. The AEIOU analytic framework from eLab (Wasson 2000) guides the interpretation of fieldwork observations and is used to assist coding data in the first stage of analysis as well as helping build theoretical models to address issues from clients in a business context. The A (x 4) method can be used for understanding, exploring and communicating scenarios about new experiences for consumers (Rothstein 2003) and is based upon key factors that make up

experiences with new products, environments and services. The Bringing the Outside In framework (Sotirin 1999) was used to help students advance their practical experience of conducting ethnographic observations, enabling categorisation of seemingly familiar things and challenging common-sense assumptions about them. The POSTA framework is made up of simple categories for data collection and can be used for the purposes of innovation in a business setting (Euchner and Henderson 2011). The POEMS framework (Kumar and Whitney 2003) was initially developed as a tool for recording users' interactions when making notes about video data.

<b>9 Dimensions</b>	<b>AEIOU</b>	<b>A (x4)</b>	<b>Bringing Outside In</b>	<b>POSTA</b>	<b>POEMS</b>
Space	Environment	Atmospheres	Territory	Situation	Environment
Actors	Users	Actors	People	Person	People
Activities	Activities	Activities		Activity	
Objects	Objects	Artefacts	Stuff	Objects	Objects
Acts	Interactions		Talk		
Events					
Time				Time	
Goals					
Feelings					
					Messages
					Services

**Table 2.** Table of Observation Frameworks

Each framework includes specific themes (see Table 2). All provide a focus on people, their environment and the objects being used. Four of the frameworks have a category concentrating on activities whilst both the 9 Dimensions and POSTA frameworks distinguish time as a specific category. The 9 dimensions framework also further breaks down more work-orientated observations into events and goals along with considering feelings. The POEMS framework considers Messages and Services as distinct categories, characteristics that are not explicitly covered in other frameworks. Given that the observations that will be made are in a public setting, where there potentially will be an abundance of Messages and usage of Services, this is the most appealing framework to apply within the method. Another reason for selecting this is that it was originally

developed as a framework when there is a requirement for deep user research with only a short amount of time available to carry it out.

### **3.4 Field Notes**

Field notes are accounts of experiences and observations from a researcher during intense involvement with participants (Emerson, Fretz, and Shaw 2011). The writing of a descriptive account is a more difficult process than it might initially seem. The activity is not just concerned with capturing an observed reality as closely as possible. This point of view holds the assumption that there is a potential definitive description of a specific event. There is no single correct method of writing. The proposed DiCER method will use the variety of interpretations offered by multiple fieldworkers and observations they make as a key strength to cover a diverse range of perspectives.

## **4 BROAD EXPERIENCE RESEARCH COLLABORATION**

The development of the divergent phase of the DiCER method was through two studies using large groups of people to make fieldwork observations. The studies apply an ethnographic observation method focussed on the topic of collaboration in public spaces. The first study, *Urban Traces*, applied an existing framework for making observations from the field of behaviour science in architecture. The second study created an entirely new framework for making observations and built upon lessons from the previous study to refine the approach.

### **4.1 Study 1 - Urban Traces**

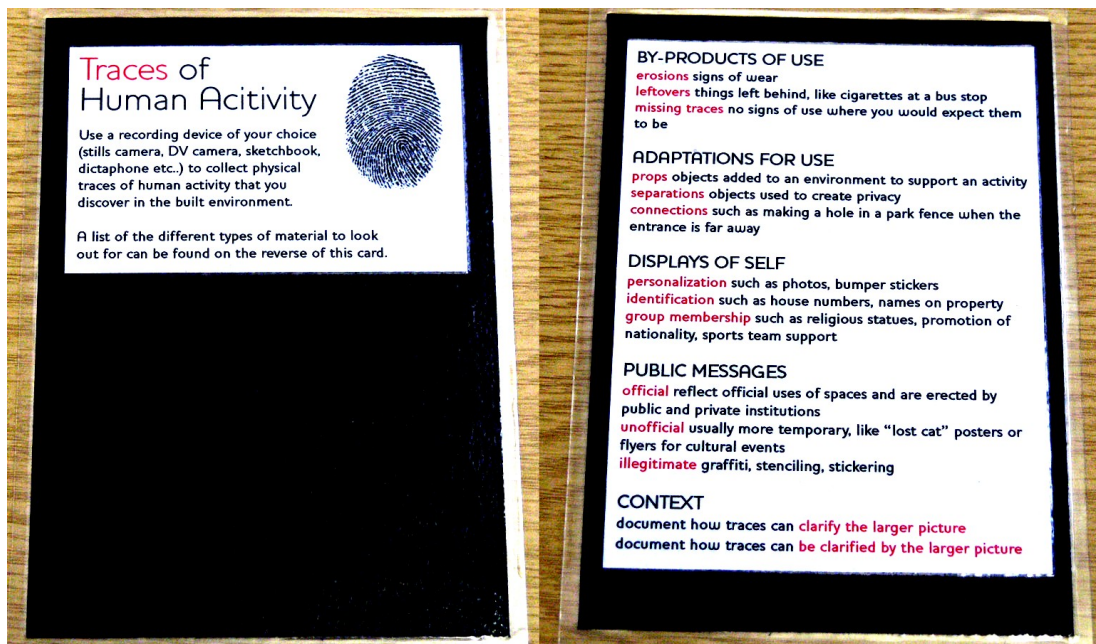
This study explored ways of gathering visual material by working with people distributed across a public setting within a short time frame using an already established framework. The goal was to inform the design of a system to facilitate shared experiences in a public setting. This was a deliberately broad focus wide at the early stage of the research. It involved working with a group of novice design ethnographers to help observe, gather and analyse visual material. The observation task focused on finding evidence that showed the physical traces of human activity in the built

environment (Zeisel 1979). The original framework from Zeisel sets out 4 different categories of trace to be observed: (1) *By-products of use*, (2) *Adaptations for use*, (3) *Displays of self*, and (4) *Public messages* (see Fig. 2 for examples). This material was shared amongst and analysed by the group leading to the emergence of new themes.

The investigation of activities occurring in local spaces to inform the design of new technology concepts has previously been explored (Smyth and Helgason 2010). Participants made use of everyday technologies to collect material for use in further design-orientated activities, such as the creation of mood boards and drawing sketches. The purpose was to open up the opportunities for designer and technologist participants to be involved in the collaborative design process. Participant field workers were dispersed across an urban environment, a large city (Edinburgh) Twelve students on a Masters of Design Ethnography course participated. Participants (n=8; 4 male, 4 female) put themselves into pairs and each team was given a pack containing:

- An *instruction card* (see Fig. 2) containing the original framework from Zeisel along with additional examples added to help clarify the type of material required by each trace.
- A *sketchbook*, with a label stating “Use this to draw or write down any notes on the traces of human activity that you discover.”
- A *plastic wallet*, labelled “Use this plastic wallet to collect any tangible materials you find that someone may have left behind by mistake or on purpose.” This allowed collection of any loose material that might provide further evidence on the use of the public spaces.
- Participants brought along a *recording device* of their own choice to document the traces in situ.





**Fig. 2.** The instruction card given to participants.

Participants were asked to photograph the physical traces of human activity they discovered in the built environment. The provided sketchbook was also used to write down any scratch notes or drawings to help document their observations. The group were briefed and given the materials pack just before the task begun. The instructions emphasised consideration of the context the traces were found in, as the traces help clarify the context but the context is also clarified by them. The observations lasted three hours, and groups were encouraged to take regular breaks to discuss strategy.

A total of 257 photos were contributed along with notes from each team to help document any other observations.

**By-products of use.** The foot of the David Hume statue (see Fig. 3) situated along the Royal Mile shows *erosion* caused by people rubbing it for good luck (Wiseman 2009), demonstrating an aesthetic of use that has emerged by engaging with the piece of public art over a long time.



**Fig. 3.** Eroded foot of the David Hume statue.



**Fig. 4.** Leftover cable ties and squid sticker.

The cable ties attached to lampposts (see Fig. 4) have been used for fastening notices and are valid under multiple categories from the framework. They have been *adapted for use* from their original purpose of securing wiring to holding a notice. As the notice is no longer present, they demonstrate a *missing trace* that would have formerly displayed a *public message*. Finally, as the cables ties have been left behind, they are classified as a *leftover*. Also shown is a funny *illegitimate* sticker.

***Adaptations for use.*** Common sightings throughout the returns were bike locks, often with a bike no longer present. This could be interpreted as a sign that a theft has taken place or as a placeholder for someone who regularly visits the location and has left the lock behind.

***Displays of self.*** A cross and number has been handwritten outside someone's front door in chalk (see Fig. 5) marking *identification* of the address. Given the temporary nature of chalk, it would need to be reapplied over time even though the number 42 is a permanent piece of information.

A provocative “Scottish not British” sticker has been placed on a signpost. This indicates a type of *group membership* portraying the nationality and political agenda of the person who placed it there. The sticker is also valid under the category of an (illegitimate) *public message*.

***Public messages.*** The collected material showed a mix of official, unofficial and illegitimate public messages. Through looking at examples of groups of stickers (see Fig. 6) it seemed that once a place has been marked with a sticker, others began to appear nearby. This created a cluster of messages and marked a space that people use as a platform to communicate with a public audience.



**Fig. 5.** Chalk helps identify the house number



**Fig. 6.** Illegitimate stickers on a high up sign

The positioning of the stickers, and other illegitimate markings such as graffiti, may be related to the difficulty with which it is placed there and equally how easy they are removed. Unofficial messages were often positioned in places alongside or even covering up pre-existing official messages.

Four follow-up sessions were held that allowed participants to discuss what they had observed and to start making sense out of the collected material.

***Dump and distil.*** The first session was held the day after the fieldwork, where participants shared the collected material on a table and looked at the different approaches taken. Each team discussed their experience of the fieldwork process.

One team reported they had got caught up simply collecting as many traces as possible rather than stopping to think more about the evidence as they went along. The team tried to counter-act this by allocating roles of taking photos and in backing up the photographed traces with scratch notes and sketches.

***Presenting the material.*** Each team selected and presented 5 key images, which gave the rest of the group a brief overview of the range of traces found. Each team discussed what they had been looking for and why they had taken certain photos.

Although it was helpful to gain the group's initial feedback and review what had been collected, it became apparent that there was a need to create an archive of the material for further sharing and analysis. Due to the high volume of photos collected, the challenge was to store this visual material so it could be shared and used for further analysis. The ability to annotate the photos was essential.

It was decided to use Flickr, given its tagging and annotation facilities, and a private pool was set up so that only invited members could see the photos.

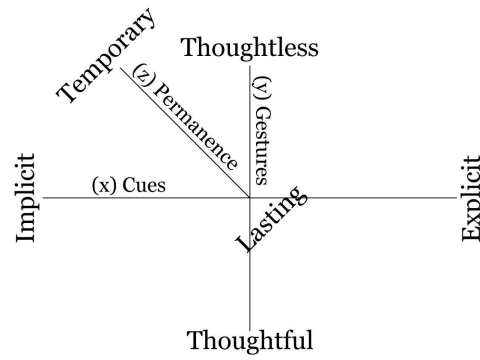
Participants uploaded their photos and tagged them with keywords stating how each image fitted into the original Ziesel framework. Tagging could show where observations were made in the same category.

**Identifying Emerging Themes.** To discuss the material in the context of design opportunities for collaborative interfaces in public space, new themes were required, based around the concept of collaboration and interpreting such activity. Next, each person wrote onto post-it notes the themes they had interpreted, placed onto the wall and grouped based on similarity. The emerging themes were: Connections & Threads, Security, Permanence & Layering, Adapting, Continuum of Personalisation and Thoughtful/less Gestures.

**Thinking Across Axes.** With a range of new themes for the material to be arranged around, three themes were selected and opposite examples stated. The criterion for the selection of the themes was to represent the full story of each trace. This took into account how the original trace was made, how others might observe it and the length of time the trace is likely to be present. By creating a space of meaning for these images to be arranged within (see Fig. 7), it gave a good overview of how these all related. The chosen themes were:

- *Gestures:* Thoughtless to Thoughtful –the amount of intention from people who have placed or made the trace in the first place. Plotted along the Y-axis.
- *Cues:* Implicit to Explicit: Whether the meaning of the trace created a visible sign to indicate that others may follow suit. Plotted along the X-axis.
- *Permanence:* Temporary to Lasting – The lifespan of the trace and how long it was likely to last. Plotted on the Z-axis to give a sense of layering through time.

By zooming out from all the collected material, we hoped to make sense of it and test the robustness of the identified themes.



**Fig. 7.** A plan of selected themes along X,Y,Z axes

The pool of images was narrowed down to 62 from the 257 using the criteria of diversity and clarity. The diversity was to have a wide range of different traces to choose from based on the original framework and clarity was so it could be easily seen what trace had been documented without further explanation.

A final session took place where participants arranged the printed photos on a tabletop (see Fig. 8). As the table was flat, only two themes could be selected so a choice had to be made between the themes of *cues* and *gestures*, as these were quite similar. The themes of Permanence (Y-axis) and Cues (X-axis) were selected as they helped tell the story of the lifespan of the trace and indicate the likelihood of others creating a similar trace.

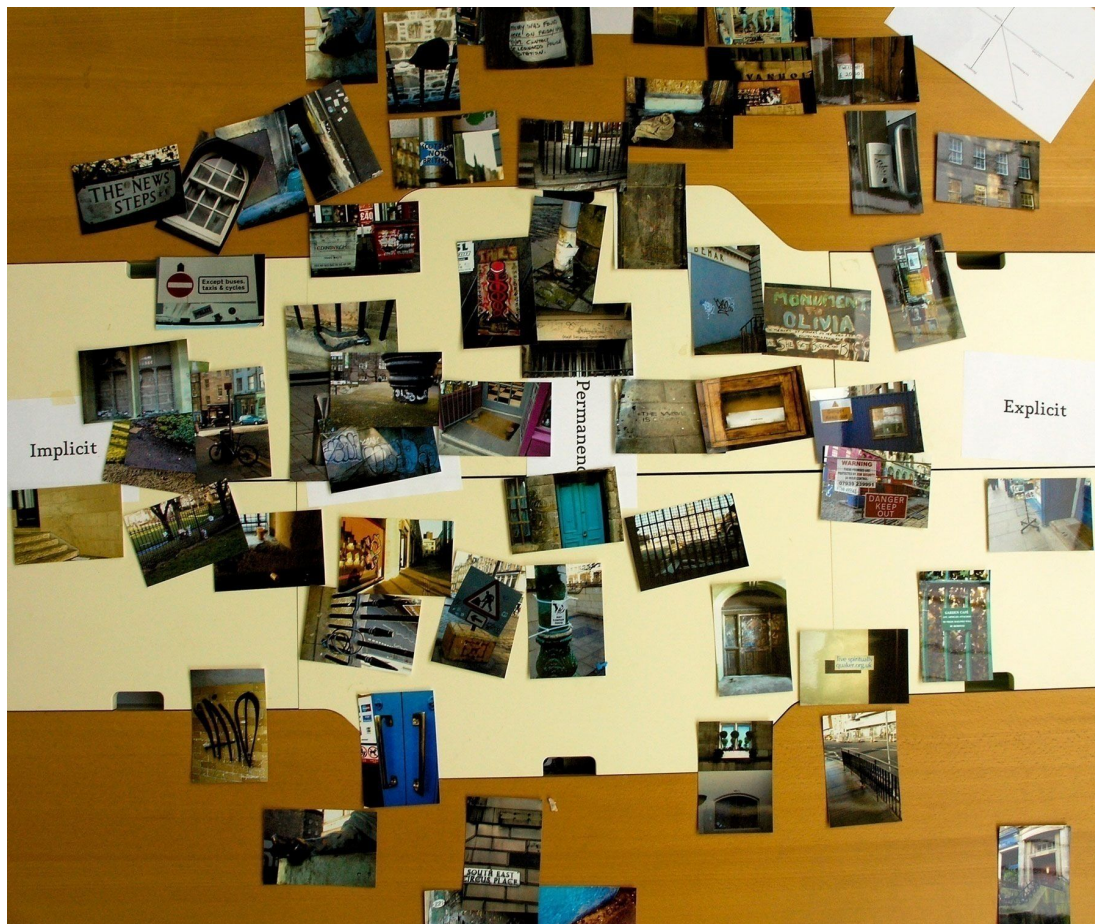
Conducting this exercise helped see if the selected themes were appropriate. The permanence axis seemed to work well however, the cues axis was less successful as it was sometimes difficult to differentiate between how implicit and explicit meanings could be interpreted.

A problem occurred when there was more than one type of trace in a single photo, the solution to which might be to have multiple copies of the photos. The lack of a 3<sup>rd</sup> axis to explode the photos out from made it difficult to easily see some of the photos as they became layered.

Whilst the fieldwork resulted in a large set of materials, to be practical to a commercial organisation, more focus was necessary, to constrain the conceptual and physical areas of investigation i.e. setting specific themes and locations for the participants. It was also felt useful to widen the *type* of material to be collected and to deepen an understanding of the observed activity. It was thought this could be achieved by putting greater emphasis on writing more notes to document



observations. Analysis would benefit from having greater structure in the way individual teams and the whole group arrived at their understanding.



**Fig. 8.** The photographs arranged spatially on a tabletop.

## 4.2 Proposed Divergent Phase of the Method

The proposed method builds on the outcomes from the pilot addressing some of the previous limitations. In essence, this suggested an approach for distributing qualitative data gathering across a group of non-specialist observers, reducing the fieldwork to simple tasks. These tasks were framed and facilitated by an experienced design ethnographer.

The first stage was splitting the problem of identifying opportunities for collaborative technologies situated in a public setting into four themes. Reference materials were prepared and two-person teams were assigned to work on each theme at different locations. The observations occurred on a single day brought back into the studio, shared with other group members, and

consolidated. An affinity-mapping workshop was held where the group analysed the material they had gathered and directions for further research exploration were identified.

### 4.3 Study 2 – Connections, Transactions, Interactions and Conversations

This provided both insights into how to design for such contexts along with techniques for managing the research process. It set out four themes to guide observations, under the broad aim of finding design opportunities to encourage shared experiences in a public setting. Each theme was explained using a sentence outlining the focus of the observations and three questions that the participants were asked to answer. The themes, explanations and questions were as follows:

- *Connections* - Observe how people navigate physical public space using the way finding systems that are present. How useful are the existing way finding systems? Where do clusters of people and flows of activity occur? What would happen if the way finding system were to fail?
- *Transactions* - Observe how the exchange of information, goods & services is facilitated. What are the social norms and practices taking place around self-service kiosks? How are people using public space as a platform for collaboration? Where is technology being used and why?
- *Interactions* - Observe how people interact with each other and systems present in public space. How does the space affect the way in which people behave? Where is one-to-one & one-to-many communication occurring? What kinds of technology are present and why are they there?
- *Conversations* - Observe the patterns in behaviour for ways in which people congregate in public space. What are the differences between how large groups of people behave in comparison to small groups & individuals? How does the physical layout affect places that people gather? Where are the empty spaces and why are they so?

Fourteen students on a Masters of Design Ethnography participated (n=14: 4 male, 10 female; none participated in study 1). The fieldwork was carried out in the city centre of Glasgow. As the largest city in Scotland, there a relatively high volume of activity on the day of the fieldwork. Four separate physical spaces were set out to match the research themes. The *connections* teams were

located in Glasgow Central train station; the *transactions* teams were located in The Buchanan Galleries shopping centre; the *interactions* teams were located in Buchanan Street and the *conversations* team was located in George Square. Prior permission was sought to make observations in the train station and shopping centre; no permission was given to take photographs or record video in these locations.

Each group received a plastic wallet containing: a laminated A5 briefing card, sketchbook, notebook and pencil. Briefing cards were designed giving each team a key area to focus on both conceptually and physically: one side detailed a research theme (a title plus sentence description) and three example questions loosely related to the theme, the other side had a map marking out where the observations were to be located.

**The fieldwork** began with a briefing in the city square. Participants were put into pairs, creating seven teams. The *interactions* and *conversations* teams, who were working outside, were also asked to take photographs. The *transactions* and *connections* teams were working inside so had to rely solely on written notes and drawn sketches.

Two bursts of activity took place on the fieldwork day. After the first burst, all teams gathered to discuss how the fieldwork was going. Some issues that arose were:

- Feeling overly visible whilst note taking and strategies for taking notes discretely.
- Having difficulty in deciding what to focus on when there was too much happening at once to be able to record everything.
- Pretending to do something else other than observing so that the notes could be memorised and then recorded shortly after.

After the discussion, they split up again into their individual teams and returned made further observations for an hour. Immediately after the fieldwork had finished, they wrote-up scratch notes so that nothing was forgotten.





strategy about where to focus observations next (see Fig. 10). A common approach was to take an initial walk through the space to become familiar with it and then plan how to break the observations down into manageable chunks. One *interactions* team did this by splitting the timing of their observations equally for separate parts of the street so that they could systematically move down the street in 20-minute intervals.

Where there were two teams working within the same space, they negotiated amongst themselves eliminate the possibility of a crossover. For example, the two teams working on the *transactions* theme inside the shopping centre deliberately went to the highest and lowest floors so that more ground could be covered in the time available.



**Fig. 10.** An *Interactions* team working out a strategy.

A common finding was that it was beneficial to have a higher point of view to make observations. The *connections* teams made use of the balconies available in the train station and the *interactions* teams used steps outside a concert hall to gain a better vantage point.

Many participants noted that they would like to return to the spaces again to go over some of the details they might have missed the first time around. For example, checking on the sequence of events a person who is interacting with a self-service kiosk. They also thought returning at various times of day when the spaces are quieter or busier would be useful.

***How to Share Material.*** The next step was how to go about sharing the fieldwork material between the teams. One participant suggested using a large physical map of the location. This might have been difficult for some of the interior spaces where maps were not so easily available. This

also jumped very quickly to a physical space metaphor for understanding the material whereas at this stage, we needed to remain thinking about it in a more abstracted way.

A secure virtual sharing space was set up for fieldwork notes and images in preparation for the affinity mapping. This gave the participants an opportunity to see how other teams had approached the problem of how to keep clear field notes and record fieldwork material. The total amount of material uploaded was 55 sketches, 175 photographs and 33 pages of notes. Ownership of the content was tracked. Fieldwork material was uploaded in a variety of formats ranging from single image files to packaged PowerPoint presentations. It would have been useful to have agreed a standard format beforehand.

***Extracting Super-Themes.*** We stepped back from the original themes and tried to arrive at an overall understanding of the activity. The participants were given half an hour to look over the notes and themes all the other teams had identified. All headings written onto the index cards were pulled off the wall, and laid out on a table. This allowed everyone to see where there might be overall groupings for the headings to fit. Duplicate headings and very general headings (e.g. “Technology”) were removed.

It became apparent there was a split between the interactions people have with each other and their interactions with space and technology. The participants allocated separate areas of the table for these. The “interactions between people” grouping was given the title “Interpersonal Interactions” and 12 headings were placed under this. The “interactions people have with space and technology” grouping was given the title “Ways of Interacting” and 26 headings were placed under this. A photo of the groupings was taken so they could be referred to later.

***Evaluating Super-Themes.*** To find out if the themes identified were appropriate, the original sticky note field material was used. This allowed the group to see how all of this material fits into the newly identified super themes. The participants split themselves into two large groups and divided the space in half down the middle of the table. The groups removed the notes from the wall and placed them under the super themes (see Fig. 11). This enabled them to start from scratch again

in relation to how they perceived the individual pieces of material, encouraging them not to be 'too precious' about their original groupings



**Fig. 11.** Arranging the fieldwork material under the super themes.

This exercise enabled the group to see how valid the super headings were.

**Thinking Across Axes.** Due to the limitations of the tabletop, the group quickly ran out of room. A participant suggested arranging the data along different axes. Within the studio space there was a set of wooden exhibition stands. Masking tape was used attached to them to mark out separate axes: 'person' to 'people' along the X-axis, 'tech' to 'non-tech' along the Y-axis and 'macro space' to 'micro space' along the Z-axis (see Fig. 12).

This provided the group with a new space to think about the gathered material. Photos of the post-it layouts were taken to document how far the analysis had progressed.

A week later, interviews with four participants were held to discuss their experiences of working with the fieldwork data in a large group. This discussion helped to identify points to explore in future iterations of the methodology.





**Fig. 12.** The axes the workshop participants identified.

**Sharing context.** As the two teams worked together under each theme, there was a sense of familiarity with the field notes and their origin. An interviewee working on the *connections* theme noted that the opposite team had observed the same activity from another perspective. This had felt like they were “reading a guide book for a city they had visited before” so there was a clarity that could be gained from analysing these observations. It helped that the teams were working in the same place in the same time frame so they were able to crossover and relate perspectives.

**Descriptiveness of Field Data.** When reading through another team's field notes, there was a recurring need for a standard way for writing field notes so that others can use them more easily. Some notes were written like a story in the form of long paragraphs. There is a need for a shared format that requires the fieldworker to indicate timings next to their pieces of data along with bullet points or sub-headings so that it is easier to derive key ideas later on.

The exchange of field notes was considered a useful exercise to gain a different perspective on the activity. A fresh pair of eyes reading through the field notes occasionally pulled out new pieces of data not spotted by the original author.

When extracting the data onto individual post-it notes, there was often difficulty with the level of detail recorded: for example, writing a single word that could have multiple meanings. A pre-agreed level of detail is needed for writing notes so that they can be easily shared and discussed.

**Information overload.** One interviewee stated that they had felt almost panicked at the huge amount of information that was laid out on the tabletop and it took real effort to re-engage with meaning behind each note. As there was so much to take in at once, the meaning of all the words had quickly started to disappear. A way to resolve this might be to turn some notes into visual representations to help to make some concepts more approachable and to concentrate on the ideas being represented. During the final stages, there was often a lot of duplication in the data. It would be worthwhile to start stripping out some extraneous notes and only work with the most important ones instead.

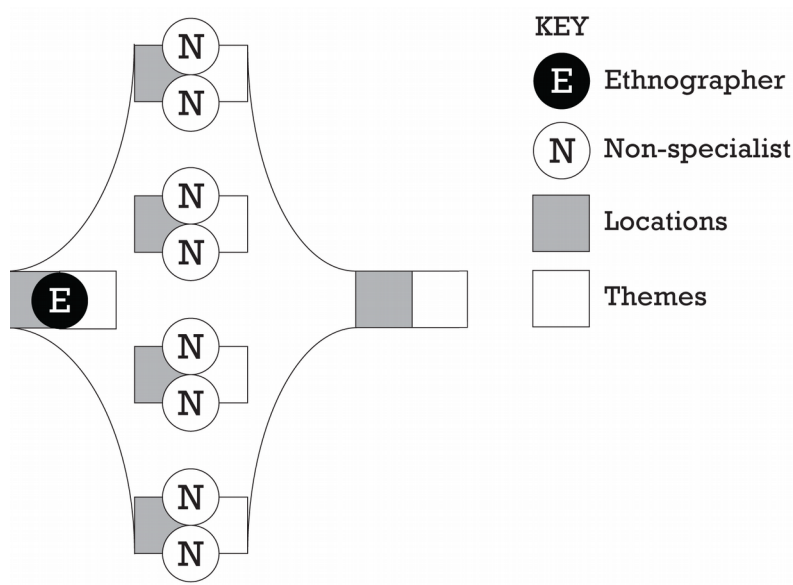
**Working across different axes.** At the end of the workshop, when the group had zoomed out of the final exercise, a lot of the information had been internalized at this point and led to constructing a physical model with multiple dimensions of meaning. This started off with two dimensions but then it was realised that three dimensions would be necessary. The participants thought that it would be too difficult to think in three dimensions but they could quite easily work across two planes at a time so the analysis could be broken down and then rebuilt again afterwards.

#### **4.4 Conclusions on the Divergent Phase of the DiCER Method**

We have presented two studies, demonstrating the development of the divergent phase of the DiCER method to support the gathering and analysis of material by a group of novice fieldworkers. The first study used an existing framework for gathering visual material showing human activity in the built environment. The second study built upon the first by developing its own framework and creating themes that were investigated across four different types of public settings. This helped to identify issues related to the design of support materials whilst conducting fieldwork and explored different ways of analysing and presenting the results. It also highlighted the need for customised tools to support recording observations in these settings.

A visualisation explaining the divergent phase of the method (see Fig. 13) shows an experienced ethnographer co-ordinating a group of non-specialists to carry out fieldwork at a set of locations and

individual themes based at each one. The fieldwork and subsequent analysis helps to generate a large amount of data which is reduced down to a specific location.



**Fig. 13.** DiCER Method: Divergent Phase Developed

The use of multiple themes helped to provide a broad range of concepts that could be interpreted differently by the teams working on each. This approach enabled a short burst of intensive activity with the production of a considerable amount of fieldwork material covering different types of behaviour and spaces. The coordination of the fieldworkers required a great deal of planning to identify the themes, appropriate spaces, negotiate permissions where required and create the necessary support material. The central organisation of these tasks ensured the fieldworkers were all working together for a common purpose, and enabled fieldworkers to focus on the key fieldwork activities.

The timescale for conducting the fieldwork was only half a day. It is conceivable that a company would use designers and other employees with a stake in understanding the consumer experience to conduct such short bursts of fieldwork, offering at least some experience of the field to a wider group and benefiting from the trans-disciplinary input.

The studies presented demonstrated the potential for using a large group of fieldworkers in a short space of time. They showed what techniques worked well and where difficulties were

encountered. This informed a further study examining closer collaboration between a designer and ethnographers over a more prolonged period.

## **5 FOCUSED EXPERIENCE RESEARCH COLLABORATION**

### **5.1 Introduction**

Next, we discuss the convergent phase of the DiCER method where a research theme has been defined to a specific design opportunity through the previous phase of the method. It demonstrates the potential benefits of transdisciplinary collaboration between researchers and designers during this stage of work. This was explored using a case study in a railway station concourse and sought to refine techniques for making observations, gathering field data, analysing the material and communicating the results. This then informed and rationalised a design intervention to encourage strangers to engage in conversation. The case study helped to demonstrate emergent issues when a designer participates in fieldwork and begins to exploit the results of an ethnographic research effort.

The previous studies sought to understand the larger context of many different types of public space and the wide range of collaborative activity taking place. This investigation was in-depth field research focussed on the specific context of a railway station and the conversations between strangers waiting there. This progression in design research can be viewed as a divergent phase followed by a convergent phase (Laurel 2003).

### **5.2 Study 3: Observations in the train station**

This study addressed observations at a train station to understand the use of this space, involving a designer working in collaboration with two design ethnography students. The brief was to understand the precursors to social interaction between strangers waiting in a train station. This work then helped to inform the selection of a design concept to encourage stranger interaction.



Glasgow Central Station was used with permission of the operations manager, who also indicated a willingness to host an appropriate intervention.

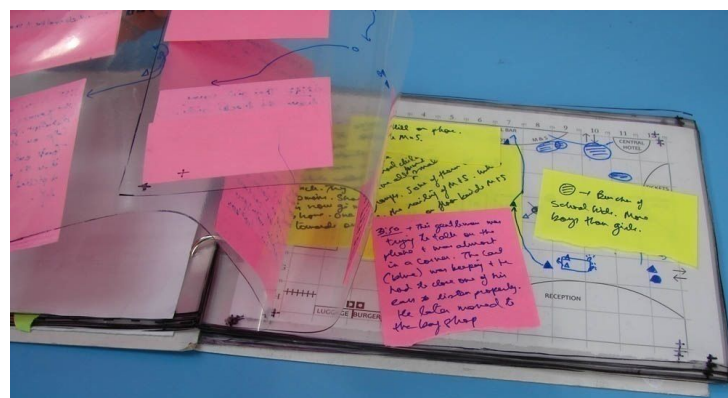
The methodology was (based around) an ethnographic study using a pair of trainee ethnographers with the research questions:

- How do people organise themselves in a public space?
- What activities and behaviours lead up to conversations between strangers?

An additional focus was to investigate how to map any ‘conversations’ and the different forms they take ranging from simple eye contact to chitchat through to more serious information exchange. Thus, the research focus in this respect was:

- What meaningful data and metrics could be gathered to record this activity as opposed to merely anecdotal evidence?

Pre-fieldwork studies at a variety of other locations were conducted to develop tools to support data collection. This helped in discovering early limitations with conventional observation and note-taking methods, especially at busy public locations. Challenges faced during pre-fieldwork became opportunities to innovate tools for data collection using both qualitative and quantitative techniques. Primarily, this was a transparency flipbook and a time-lapse recording of the space.



**Fig. 14.** The transparency flipbook.

The transparency flipbook (see Fig. 14) used a map of the physical observation space. This captured details such as the position of people relative to the space, the trajectory people were

moving in, time frames, age groups and genders. A basic map of the research location was positioned behind a transparent plastic sheet so notes and symbols could be marked where an observation had taken place. Post-it notes were used to record short descriptions and fixed next to the relevant item on the plastic sheet. Different roles were assigned: when one person used the transparency flipbook, the other used more traditional detailed descriptive notes.

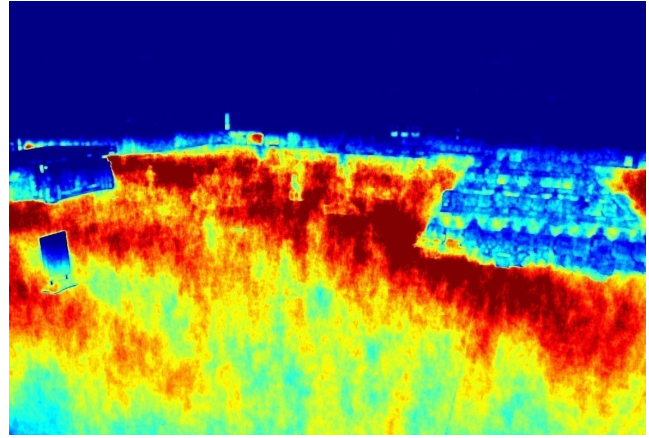
To improve the positioning further, a grid system was used over the map using numbers along the horizontal axis and letters along the vertical axis. This allowed each area to be referenced with a unique code such as “4e”. This was also beneficial for the descriptive note taking so researchers’ observations and notes could be coordinated. Markings were placed at the corner of the flipbook map and across the transparency sheets allowing reference points to be aligned. Observations were recorded on each transparent page which were used only for a limited time frame or until the page became full.

7 days of fieldwork (total 28 hours) was conducted over two weeks, covering weekdays and weekends ranging from 9am to 10pm. Each field visit lasted 4 hours. The designer accompanied the ethnographers on three occasions, making observations and taking time-lapse photographs to document activity.

**Time-lapse Recordings.** Five time-lapse videos were created to support the fieldwork material. These were recorded from two different vantage points on a balcony. The 1<sup>st</sup> location was outside the station office looking down at the area from the main station entrance through to the railway concourse. This took place on a Sunday evening from approximately 7 until 9pm. The level of activity at this time of day and week was a lot less than during peak times. The 2<sup>nd</sup> location was looking down across the main thoroughfare and seating area in front of the departures board (see Fig. 15). This took place on a Monday afternoon from approximately 3 until 5pm, a peak time.



**Fig. 15.** Still from time-lapse shot at 2<sup>nd</sup> location



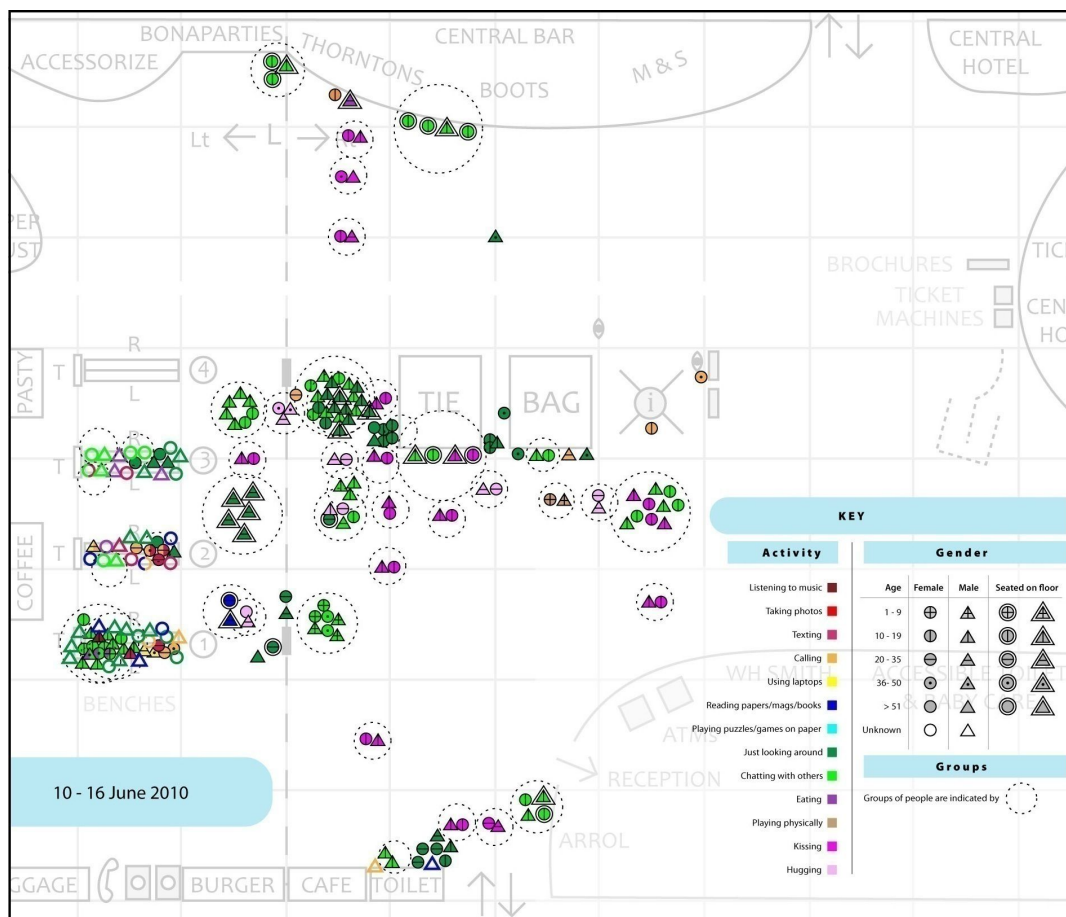
**Fig. 16.** “Heat map” analysis from 2<sup>nd</sup> location

***Time-lapse Heat Maps.*** The time-lapse sequences were analysed using specialised computer vision software (Trucco 1998). This measured the difference between pixels in consecutive frames and each time a pixel was different enough, its value in a “heat map” visualisation was increased by one. The results are shown in Fig. 16. Regions with high and low activity are shown in red and blue respectively. This showed static items within the space such as the posters stands. These images helped inform where a design intervention would best be sited to have the most impact. An advantage of this approach is to show the dynamics of the space. It can also show the impact an intervention has made with a before and after comparative analysis.

***Activity Maps.*** The material from the transparency flip-book (see Fig. 14) was collated to identify patterns in activity taking place around the seating area. Nine maps were created over time spans ranging from 3 minutes to 4 hours, over a period of 5 days. The demographic of the observed people, their waiting activities and if they were gathered in groups or individuals was noted. The activities of 295 people were recorded; top activities were looking, texting and reading.

A visual representation of the collected material is a good way of showing the variety of activities people occupy themselves with whilst in this location. It allows collected data to be seen in separate layers or activities, which can help compare and contrast. A limitation is that the data was collected on three different days and at different times. The collection of this material was challenging, so observations have been limited to the seating area.

**Activity, Age and Gender Maps.** Further material from the transparency flipbook was mapped onto a visualisation of the space (see Fig. 17) along with annotations to show people's age, gender and if they appeared to be in a group. Amongst other things, this showed the popular places for couples to kiss and the instances of groups 'hanging out' as well as sitting on the floor. When the shops were shut, people sat close to them and used the walls or shutters to lean on.



**Fig. 17.** Collated activity, age and gender map over 6-day period

The map provides a more detailed representation of activities on the railway concourse and showed the activities people are more likely to engage in whilst in a group. The visualisation does have more depth although a limitation of such an approach is managing the collected data, as when there is so much going on it can become confusing. A workshop to analyse the gathered fieldwork tackled the large amount of data generated throughout the fieldwork (see Fig. 18). This facilitated the cross-pollination of design and ethnography, which helped the designer as well as the ethnographers to better understand each other's perspective of the field material.

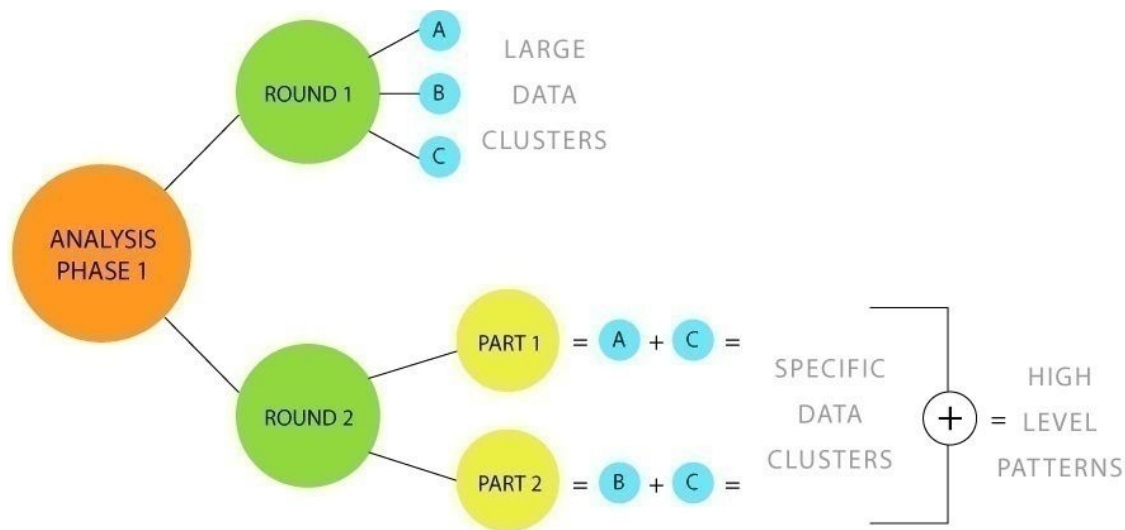


**Fig. 18.** The ethnographers during the analysis workshop.

An initial pass at the vast amount of data was made to gauge its nature and depth, so a plan for further analysis could be created. This exercise of categorising the field notes in a high-level way saw the data fit into three categories (see the 'Round 1' element in Fig 19):

- a. Propellants and Repellents of Stranger Interactions: Factors that either mediated or hindered interactions amongst strangers.
- b. Spending Time: Different ways in which people spent their time on the concourse.
- c. Spatial Configuration: Elements in the concourse's arrangement impacting people's behaviour.

During the course of the affinity mapping activity, it was clear that the spatial configuration (category c) could impact the behaviour of people in more than one way. The implication for the intervention was that the design would have to take into account understanding the mediators or hinderers to interactions with strangers (category a) as well as being aware how people spent their time on the concourse (category b).



**Fig. 19.** An overview of the analysis workshop method.

The designer added observations from the material he had collected under the three categories. At this point, all notes from the spatial configuration category were duplicated, to allow them to be affinitized individually with the 'spending time' and 'propellants and repellents of stranger interactions' categories (see the 'Round 2' element in Fig. 19). Following this, 12 specific data clusters were created: personal gadgets, mediators, hindrances, thresholds, sitting, standing, information, kiosks, magnetism, pausing, anchoring and clustering.

The 12 data clusters were reduced to 5 key themes through combining those that were similar: approachability, the moment, anchors, gaze & graze and knowledge transaction.

**Key Theme 1: Approachability.** People in the railway station engage in activities such as watching other people, eating, chatting with friends, texting, calling, listening to music, reading or using their laptop. However, there is a certain state of 'pause', which is the time interval when people were not completely consumed by any activity. The people who fit into this paused state were the ones who appeared to be unoccupied and those who were reading books who tended to regularly glance up. For a design intervention to capture people's attention, those who are paused may be more likely to be involved than those who are intent on carrying on with another activity. Such people could themselves be initiators of interactions (with other people, systems or artefacts). This is useful for design as it helps to identify the kind of people open to interaction.



**Key Theme 2: The Moment.** As we recorded the duration of people's various activities, we could see how the average waiting time on benches related to activity:

- People who mostly call/text waited for around 15-30mins.
- People who used laptops waited for around 30-60mins.
- People who read books, magazines, newspapers or solved puzzles waited for around 60-90mins.

Most people who call/text/message were standing away from the benches, outside the floor line area, in front of the departure boards. If people are using laptops or reading, they are more likely to be in the station concourse longer and hence may be more approachable for interactions.

**Key Theme 3: Anchors.** People clustered around existing objects (poles, boards, walls, benches, stalls) as anchors for activities. When they clustered on benches, they watched people, ate food, read, used laptops, listened to music, chatted with friends or texted/called. People who stood beside the floor-mounted posters watched the departure boards, called or texted. They tended to lean on to more sturdy objects such as a pole, information panel stand or the wall of a shop, while calling/texting. Couples used the space around the centrally located shop; many spent around 20mins there cuddling and talking intimately. The patterns of behaviour around these anchors suggest that the anchors themselves may offer interesting design opportunities.

**Key Theme 4: Gaze & Graze.** When people waited, they spent most time just watching other people. While doing so, they are also being watched by others, instigating similar behaviour. When someone sat on the floor in an unusual space like the centre of walkways, they established it as normal/acceptable, so other people started sitting around them. Observing others and being observed can be made more explicit using a design intervention. When one does something new, it breaks the ice and others may follow the action without the awkwardness that people generally feel when initiating an interaction with a stranger.

**Key Theme 5: Knowledge Transaction.** People queued as a social norm, around kiosks/info outlets, but they huddled around brochure stands. They both need and have certain information and may end up interacting with each other around this knowledge. An example was policemen who

sometimes chatted with people who approached them for information for around 5-10mins. As people need information, those sites of information in turn may become useful sites for encouraging social interaction. The design intervention could incorporate this.

***Communicating the Themes.*** The areas identified through the analysis had to be communicated to be useful for design. It was apparent that some theme names were reliant on metaphors that could be difficult to understand for someone who has not participated in the fieldwork or analysis. Even if they were understood, it could still be difficult to see how the themes fit into a designer's practice.

To counteract this challenge, a template was created to support the communication of the themes and the insights they offered for design. This required the outcomes of the analysis workshops to be linked with the themes, the evidence in the fieldwork and the meaning they have for design. Each theme was given a suitable name so it could be easily referenced during any discussion between the researchers and designer.

### **5.3 Study 4: Design Intervention**

Whilst the focus of this section is on the collaboration between a designer and ethnographer, the development of a design intervention was used as vehicle for understanding this aspect of the method. Other people have created similar types of design intervention such as Greyworld and their railings in the city (Shoben 2009; Dalsgaard, Dindler, and Halskov 2011).

The aim was to encourage conversations between strangers waiting on the station concourse. The reasons to encourage such social interaction include:

- To counteract the socially isolating effects of people using personal technology devices.
- To foster a fun atmosphere within the railway concourse environment where people are enjoying conversations and chatting to each other. This may help to relieve stress for passengers when there is a delay with the railway network.

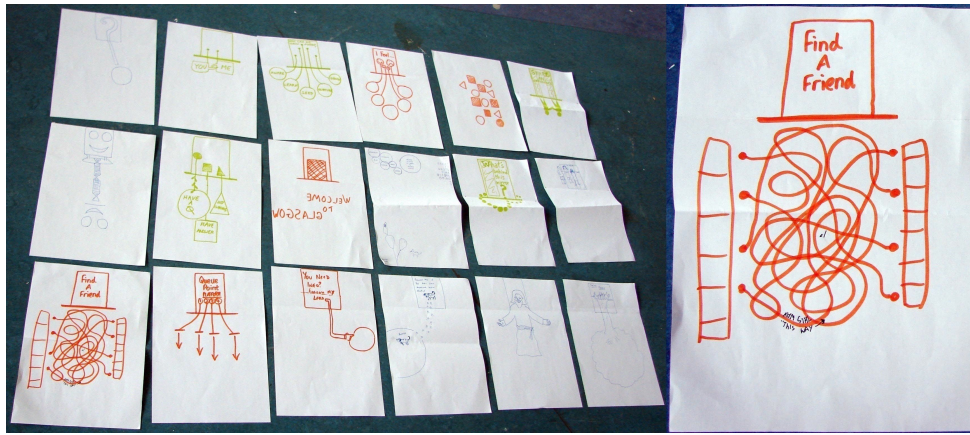


- To help generate social capital (Putnam 1995) to facilitate the establishment of behaviours and norms that make people more willing to help each other. This could be useful for gathering opinions and increasing civic engagement around a particular issue that affects local people.
- To help assist with crime prevention by speaking to people to extend their sense of social responsibility and decrease the likelihood of petty theft (Davey, Wootton, and Press 2012).

These concepts were informed by the ongoing primary research. Once the material from the station was analysed, the proposed concepts were evaluated to see which would be most appropriate: they were presented to the ethnographers following the analysis workshop and considered in light of the themes arrived at from the observations in the station. Characteristics of two concepts were taken forward: making use of the concourse floor as a space for information display and linking parts of the space and the people in those places, using markings on the floor.

Iteration involved generating more ideas around the chosen concept, testing it in the studio and installing it in a public location.

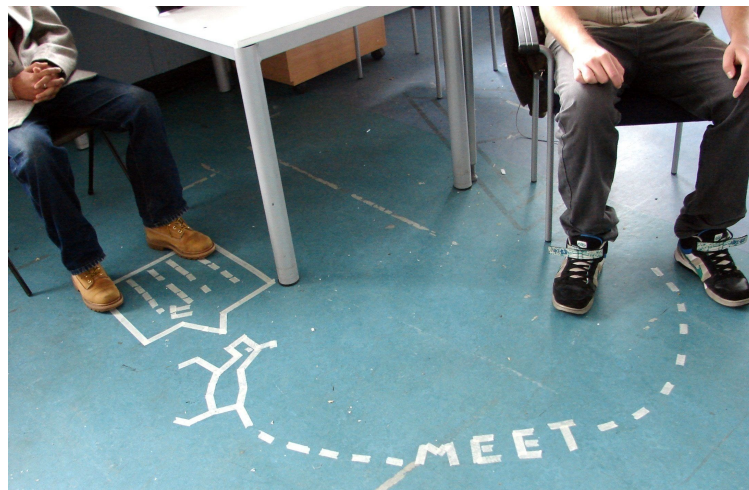
**Ideation.** The group rapidly generated as many ideas as possible that made use of the floor in conjunction with the poster stand (see Fig. 20). The principle of connecting people in need of some information with people who were able to provide the required information (for example, directions or train timetables) was explored using different types of imagery on the floor. This approach tied into the previously discussed “Knowledge Transaction” and “Anchors” themes. The seating area was regarded as a good place to facilitate interactions, as this is where people in a “Paused” state were frequently located. The individuals who were anchored within the seating area were busy reading, playing word games or people watching so it was important to make sure the design intervention touched upon the key themes of “Approachability”, “Anchors” and “Gaze & Graze” .



**Fig. 20.** The range of ideas using the floor and poster stands (left). The selected idea (right).

**Selection.** The themes were used as selection criteria to help decide which idea to take forward.

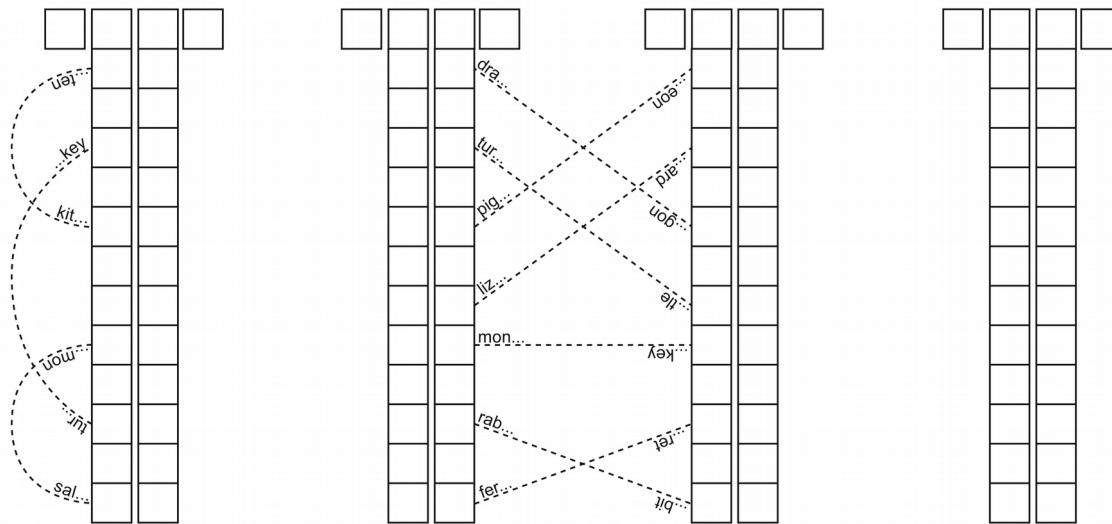
There was a shared consensus that the chosen concept should be light-hearted and fun to use. A particularly resonant idea with the team was a simple game where people had to track-down pieces of a puzzle. This involved connecting seats using markings on the floor with a missing piece of information located at the other end to encourage people to seek out the missing information by following the line and then hopefully finding someone else at the other end. A variety of different types of information were considered such as questions and answers, a mascot or pieces of a puzzle.



**Fig. 21.** An early experience prototype using tape on the floor.

The studio floor and some masking tape were used to quickly prototype the idea (see Fig. 21). A key element was to decide which type of information would be most suitable to use. Fun facts and quiz questions seemed like the most obvious choice at first but we wanted to keep the intervention as simple as possible so it was easy for anyone to engage with it.

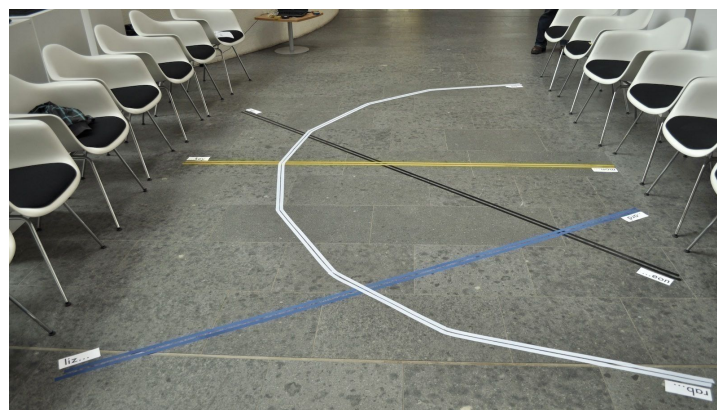
**Planning and Prototyping.** It was decided to use six-letter animal names as a neutral form of information to provide a good discussion topic. The names were split to provide three letters at either end of the lines. To ensure people who read the half-word on the floor by their feet would realise there was another part at the other end, three dots were added after or before the half-word.



**Fig. 22.** A plan of the proposed intervention.

A plan was created based on the existing layout of the seating area in the station (see Fig. 22). to work out how lines might cross each other in different ways and using semi-circles to link seats that were not facing each other.

**Prototyping.** A full scale experience prototype (Buchenau and Suri 2000) of the intervention was created (see Fig. 23) to help understand how it would be installed, the types of materials suitable and what the actual experience would be like.



**Fig. 23.** An experience prototype.

Unexpectedly, permission was not granted to install the intervention at the station even though this had been provisionally agreed. An area outside a shopping centre was used as an alternative, which has a similar layout of benching and seating facing each other (see Fig. 24) as the station.



**Fig. 24.** The ethnographers helping install the intervention.

Throughout the day after installing the intervention, the ethnographers observed the effect it had. Many people who noticed us setting up the prototype, looked on curiously then inspected the prototype after we finished. As it became busier, people walking through the area seemed to notice the prototype after they had walked across one or two lines. However, they did not appear to stop and read the words that were at either end. There were instances of children running along the lines, with some reading out fragments of words randomly to try and make sense of them, but none were able to make the connections between either ends.

Only one lady noticed patterns and read out all the animal names for two friends she was with. After this happened, a young girl and her mother also read out the names. As the day wore on, less people noticed the pattern on the floor and when we returned to remove the installation in the evening, all the tapes had been ripped off leaving only the lettering behind.

The performance of installing the intervention attracted more attention than just the installation on its own. The people who talked to us were much more interested in the motivations of the intervention than anyone else who encountered it all day. We had in a sense become street performers during the time we were installing it, which was much more likely to provoke

conversations between people. This realisation fundamentally questioned the form of the intervention we had created as something, which could not be simply placed in the space but must be acted out by performers situated there.

A refinement of the prototype was installed at the same location as the previous version. The phrase used was from a joke by Ivor Cutler and said “MADE OF DUST”. This longer phrase was placed along the lines instead of word fragments at either end. The lettering was rethought to be cut-out inside of blocks of sticky plastic to create a stencil effect. It was hoped that when the stencils were removed, traces of the art would be left behind, with the letters made of dust. This version of the intervention was more prominent and was not removed throughout the whole day.

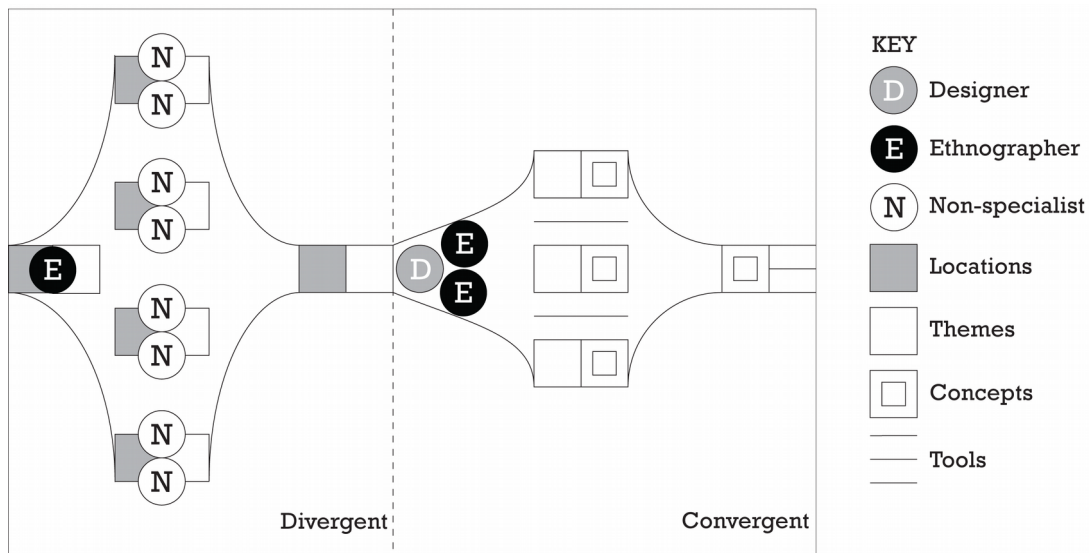
This completed the design cycle of creating a prototype, testing it and refining it. It provided sufficient understanding of the advantages and limitations of this type of intervention. It enabled us to apply the findings from the station observations to inform a design concept for installation in a similar kind of public space. Most importantly, the prior research and subsequent production of the intervention demonstrated the results of a close collaboration between designer and ethnographer.

## **5.4 Conclusions on the Convergent Phase of the DiCER Method**

This convergent phase of the DiCER method used an in-depth ethnographic research project focussed around a very specific problem. This involved transdisciplinary collaboration between a designer and two ethnographers to conduct fieldwork at a public location (e.g. a station) and then through further analysis, generate themes based on the observations made. One outcome was a concept for a design intervention to provoke social interaction at the location. This demonstrated ways in which findings from an ethnographic study can be exploited in the design process.

The earlier divergent stage involved many themes across different locations, whereas this phase used a particular problem (i.e. limited social interaction between strangers) in a specific space (i.e. a train station) to help constrain the scope of the fieldwork. The research tools and techniques that were developed needed this convergent phase to evaluate their usefulness in supporting collaboration between design and ethnography.





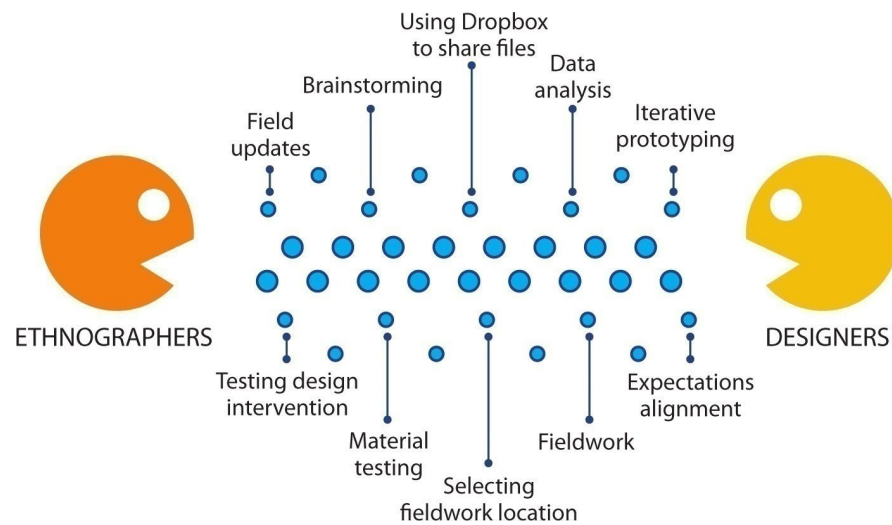
**Fig. 25.** DiCER Method: Convergent phase developed in this section

A visualisation of the method (see Fig. 25) has been extended to show the convergent phase. This shows the designer and two ethnographers taking forwards the location and theme from the end of the previous divergent phase. The fieldwork described took place over a longer period (multiple visits across two intensive weeks) in comparison to the fieldwork in the previous section (a single visit for half a day). This resulted in substantially more depth from the findings as the research protocol was given more space to evolve and helped generate a larger amount of fieldwork material for a focussed topic. This length of fieldwork provided sufficient time for the designer and ethnographers to iterate on the research protocol, support materials and fieldwork techniques.

An additional element of this convergent phase involves close collaboration between a designer and ethnographers working in a very open, trans-disciplinary way so not restricted by their disciplinary boundaries. This helped foster a meaningful dialogue between two disciplines from the outset (see visualisation in Fig. 26), where the designer participated in the earlier fieldwork and data analysis, through to the final stages where the ethnographers extended their involvement into generating, prototyping and testing concepts for the intervention.

The collaborative approach of deeply understanding a context and developing design solutions based on this was not the standard industry practice where specialists usually transfer knowledge to a design team as actionable insights. This model of working collaboratively in a design research

team during all stages of the development process has potential for any organisation committed to innovating new products and services based on ethnographic research by embedding researchers and designers in each other's practice.



**Fig. 26.** Visualising the Collaboration Between Designers and Ethnographers

A further element of this method phase is that new tools were prototyped and used including (1) tangible data collection tools such as the transparency flipbook with base-map, (2) mapping and visualising activities using shared standard symbols between team members, (3) analysis of video data and time-lapse recordings as a useful way to summarise the overall dynamics of the research location, (4) templates for linking themes from the data analysis back to evidence from the field and forward to wider design recommendations.

The study provided further validation of the method. It demonstrated the level of depth achievable in a slightly longer timeframe and showed the outcomes when converging on a more specific problem.

## 6 APPLYING THE DICER METHOD

This section validates the DiCER method by using a group of non-specialist employees distributed across a large organisation to fulfil parts of a fieldwork project. Additionally, it develops the training phase of the method to enable non-specialists to participate in fieldwork. The notion is

that organisations can enhance their field research capacity for a minimal investment if they train and deploy existing staff to undertake short, focused periods of field observation.

## **6.1 Adapting the Method to Use Non-Specialists**

The aim is to adapt the method for it to be used with employees in a company rather than student design ethnographers. In the case study below, the method is applied using staff at a university with the focus on gathering material to inform public engagement activity. The main difference, if using employees rather than student design ethnographers, is the need for additional training. The purpose of the training was to enable the participants to effectively make observations, write and contribute field notes whilst travelling. The design of the training was based on the experience in previous studies, which helped to identify some of the training material required and difficulties when co-ordinating fieldwork involving a group of people.

### **6.1.1 Training Participants to Conduct Fieldwork**

The training was designed to take place over two 1-hour lunchtime sessions. The first session involved a presentation on the theory behind the study, discussing how to make observations, what to observe, what form field notes should take and a short practical exercise to try out necessary skills. The second session involved the participants discussing what they had seen in the homework activity by talking about their experience of making observations and writing field notes.

### **6.1.2 Training Rationale**

The training aimed to:

- Give participants some background to the study and motivation to help contextualise the observations they were instructed to make, and provide participants with enough knowledge of conducting fieldwork so they felt confident making observations and documenting them.



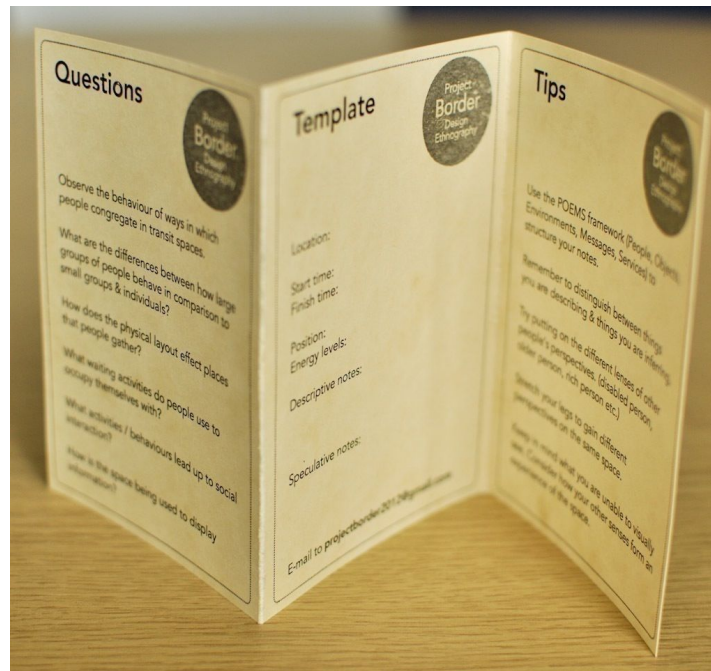
- Give participants an opportunity to try out their fieldwork skills using a practical activity and share their experiences. As the participants in this study would work alone, it was important for them to try out fieldwork before doing this for real.
- Provide support materials to use in the field. The provision of briefing cards had worked well, so this was extended in this iteration of the method.
- Give a clear way to structure observations and write field notes. As the non-specialists need to produce field notes early on, a framework and template was provided.

### 6.1.3 Training Activities

**Materials.** To support the fieldworkers, a framework was provided to prompt observations and structure the writing of field notes. As explained in section 3.3, we used the POEMS observational framework (Kumar and Whitney 2003). This framework aimed to be used as:

- A filter when there is too much going on in the context being observed and it becomes too overwhelming to record everything.
- A prompter when it feels like everything in the scene has been noted already and there is nothing new to see.
- An organiser to structure the notes and make them easier to write-up later on.

A reference card (see Fig. 27) was provided to support the participants whilst out in the field. This could be folded and kept in the participant's pocket for easy reference whilst in the field. It contained 3 panels. The questions panel included broad questions to guide the focus of the fieldwork (dependent on the topic of research, see section 6.2.3).



**Fig. 27:** Reference card provided to the participants.

The template panel provided a structure for the participants to use when writing their field notes. It set out the following fields of data to record with each set of notes: Location, Start time, Finish time, Position, Energy levels, Descriptive notes, Speculative notes. The first five categories were to contextualize where participants had observed, how long for and how they were feeling at the time. The last 2 categories were the main body of field notes with a split between descriptive and speculative notes, to encourage participants to clearly distinguish between what they saw compared to what they had inferred from what they saw.

The tips panel contained hints and prompts to support the fieldwork:

- Use the POEMS framework (People, Objects, Environments, Messages, Services) to structure your notes.
- Remember to distinguish between things you are describing & things you are inferring.
- Try putting on the different lenses of other people's perspectives. (disabled person, older person, rich person etc.)
- Stretch your legs to gain different perspectives on the same space.

- Keep in mind what you are unable to visually see. Consider how your other senses form an experience of the space.

This mostly reiterated the instructions that had been provided during the training. The first two tips detailed the POEMS framework and describing / inferring what had been seen relate to the writing of field notes. The final three tips concerned gaining additional perspectives either by thinking of other people, other physical points of view or through using other senses.

**Training Session 1.** To encourage discussion, the training sessions were delivered to small groups (between six and eight). Definitions and quotes were given to the participants describing what it means to observe people and why it can be so powerful. The difference between scratch notes and field notes was explained. The participants were asked to send in their field notes via e-mail shortly after their observations had been made with examples provided to show the kind of material to contribute. This contained an example of someone commuting via train and someone travelling long distance waiting in an airport. A booklet called 'An Ethnography Primer' by AIGA containing a brief introduction to ethnographic research for design was provided. At the end of the 1<sup>st</sup> session, homework was set for participants to make observations during their journey home from or to work.

**Training Session 2.** The 2<sup>nd</sup> session involved working through each participant's homework field notes and discussing how they had undertaken the activity. This 'mini-crit' helped to see how others had gone about the task and helped reflect on their experiences. Finally, participants discussed their assumptions about what they expected to see whilst travelling.

Issues that arose during the 1<sup>st</sup> session from the initial presentation included questions on the frequency of contributing material, suitable communication channels and the length of time to make observations for.

**Field Note Frequency.** One participant queried the length of the field notes and how often they needed to be taken. No lower or upper limit was stated for the contributions so that those who wanted to contribute more, felt able to do so. There was also an assumption from the commuting

participants that if they travelled on the same journey, every day there would be nothing new to record. Strategies were discussed to overcome this such as taking other positions in the space or referring back to the POEMS framework for different things to consider.

**Communicating Field Notes.** Two participants expressed an interest in using other types of communication channels such as SMS or Twitter. One reason for this was to feel less conspicuous recording notes on a phone rather than writing in a notebook. After discussing this issue, it was agreed that scratch notes could be written on a phone if this felt more appropriate but sending in field notes via e-mail was preferred. There was also a query about whether scratch notes needed to be sent in as well as field notes. Scratch notes act more like an aide-mémoire for the fieldworker so they are likely to be the only one that can understand them. Only the field notes needed to be sent in as these have been written up with further detail.

**Observation Length.** There was uncertainty from one of participants about how long observations needed to be made for. They were asked to engage in the activity for as little or as long as possible whilst waiting in the transit places. It was suggested that it was better to spend a short burst of time noting as much as possible rather a longer period noting very little. A motivation of the method is that it makes use of spare time whilst waiting somewhere rather than setting aside a specific period to conduct observations.

Issues that came out of the 2<sup>nd</sup> session following the homework activity were related to making observations, writing field notes and the level of detail that was required.

**Making Observations.** What participants observed depended on their backgrounds. For example, a participant with a marketing background noticed the scruffiness of the posters in the space they were observing. One participant commented that once they started to notice things, they could just sit there for hours, as there was so much to see. Another participant commented that they usually tended to people watch and read adverts whilst being bored and waiting in a transport location. So for them, the study is just an extension of this activity but documenting what had been seen.

Two participants discussed strategies for positioning within the space and the time of the day observations were made. For commuters when visiting the same transit location repeatedly, they said it would be useful to move to different places to gain a different perspective on the same space and try to cover other aspects of it.

**Writing Field Notes.** One participant noted the importance of typing up the scratch notes as soon as possible after the observations had been made.

The structuring of field notes was a recurring issue. The writing up of field notes was made easier if the scratch notes had been recorded in a systematic way such as dividing the page up into different categories. Some felt that using the POEMS framework was really helpful for doing this whilst others preferred to just write about what they had seen as a longer narrative account.

Participants felt that the distinction between the descriptive and speculative field notes was a helpful way to consider what they had observed. As the field notes were completely reliant on observations, there was only so much that could be understood without actually talking to people about what they are doing.

**Level of Detail.** There were issues about prioritising notes to record. At the early training stages of the research, it was more important that the fieldworkers were able to record as much as possible rather than being too limited by specific criteria. This could be resolved in the next iteration of the study by showing the participants more examples of low, medium and high quality field notes.

## **6.2 Case Study Design**

The study involved supporting a group of non-specialists in contributing fieldwork material who were recruited via an advertisement. The research questions were set for the participants at the outset and they were asked to return material throughout a period of two months. Ongoing support for the participants was also provided via e-mail whilst the fieldwork happened.

### **6.2.1 Participants**

Employees frequently use relevant field settings so are potentially in a position to report on their experience whilst there. The purpose of the study was to tap this latent resource to inform an understanding of activity in the space. The group of people who helped deploy the method was staff at the University of Dundee. A voucher prize-draw along with lightweight fieldworker training was offered as an incentive. 17 people (n=17: 9 male, 8 female) participated, from a variety of departments: the art & design school (4), the School of Education, Social Work and Community Education (4), the International Office (4), the Library & Learning Centre (2) and the School of Computing (3). Nine participants commuted to work on a regular basis. Thirteen travelled for business, seven of which travelled internationally.

Participants' prior experience would likely affect what they observed and the quality of the field notes produced. Two participants had previous experience of doing ethnographic research and four had come from a department, which conducts similar types of qualitative research. This is an inevitable issue with conducting a study of this nature where people self-select their involvement so they are drawn to things that interest them.

### **6.2.2 Topic of the Field Research Project**

University public engagement activities commonly involve hosting events such as free talks or family days to raise awareness about research taking place. As these are events, they can be costly to organise and may also be competing with other things happening at the same time so attendance numbers can vary greatly. To counter this, the proposal was to study transit spaces where there is a

captive audience for engaging with the public. Through observing the behaviour of people using these spaces, further questions could be generated exploring where a design intervention might be suitable to engage the public with the university's research. Many university employees regularly pass through transit spaces either when commuting to work or travelling on company business. The proposal was for employees who use these spaces to spend a small amount of time whilst there making fieldwork observations.

### **6.2.3 Study Questions**

The theme and questions the participants were asked to explore were as follows:

Observe the behaviour of ways in which people congregate in transit spaces.

- What are the differences between how large groups of people behave in comparison to small groups and individuals?
- How does the physical layout affect places that people gather?
- What waiting activities do people use to occupy themselves with?
- What activities / behaviours lead up to social interaction?
- How is the space being used to display information?

These questions were deliberately broad to empower participants to follow their instincts and not be too restricted whilst they were still developing their fieldwork skills.

### **6.2.4 Procedure**

Participants were asked to spend a small amount of time (15 – 20 minutes) making observations each time they travelled. They were encouraged to consciously go into a mode of observing for a short space of time rather than casually doing it over a longer amount of time. They were advised not to spend too long doing it as this would be very exhausting and the point of the exercise was for it to be a lightweight, non-obtrusive activity.

Following the training sessions, a frequently asked questions document was sent out. This addressed recurring questions from the training related to the required length of field notes, structure of field notes, focus of observations and how they should be transmitted.

Each time a participant contributed a field note, an e-mail acknowledged receipt and provided a small amount of feedback on what they had contributed. This related both to what they had observed and to the writing of the field notes. Participants who failed to send any field notes were not contacted again because this was regarded, for ethical reasons, as having withdrawn.

Due to scheduling issues, 4 participants were provided with the 1<sup>st</sup> training session and no follow-up 2<sup>nd</sup> training session; 3 of these dropped out of the study.

### 6.3 Outcome of the Fieldwork

From the 17 people who participated in the training, 8 contributed field notes during the 2-month study period. This was a disappointing drop-out rate. There could have been a variety of reasons for this such as travel already being a stressful time without additional activities or the lack of community involvement once the training was completed. A discussion of these issues and potential solutions is provided in section 6.5. Table 3 shows the quantity of notes.

Participant	Traveller Type	Notes	Quality	Trained
P3	International	6	Low	Full
P7	Commuter / International	6	High	Full
P9	National	1	Mid	Full
P11	Commuter	5	High	Full
P13	Commuter	3	Low	Full
P14	Commuter	2	Mid	Full
P15	National	2	Mid	Half
P16	Commuter	2	Low	Full

**Table 3** - Participants who contributed field notes.

There were more field notes sent in from the 'commuters' than the 'business travellers'. This may be because they travelled more frequently, so they had more opportunities to make observations. This suggests that organisations might be able to exploit key employee



characteristics/contexts when recruiting people. If, for example in this case, there were not enough 'commuters', the organisation would need to pay more attention to motivating the 'non-commuters' to get the required level of effort.

### 6.3.1 Assessing the Quality of Field Notes

The field notes were assessed on their quality as to which could be taken further for analysis. This split the notes into categories of low, medium and high quality. Only notes that were judged to be medium or high quality could be used for any analysis. Based on guidance in the literature on how to write a good field note (Sanjek 1990; Emerson, Fretz, and Shaw 2011) the criteria for assessing the field notes were:

- Giving sufficient context about when or where the field notes were written.
- The level of detail and depth in the descriptions that were provided.
- Clearly distinguishing between descriptive and speculative observations.
- Length of time between making observations, writing up field notes and sending them in.

### 6.3.2 Low Quality Field Notes

The following is an example field note judged to have low quality because of lack of detail as specified in the field note template. No dates or times were provided for when the observations were made or for the length of time they covered. The descriptive content is very surface level; jumping about between different observations without further explanation. There is also no distinguishing between what is being described and where assumptions have been made. The note was submitted at the same time as 3 other journeys, which may indicate that it was not written up within 24 hours of when the observations took place.

- |   |
|---|
| <ul style="list-style-type: none"><li>• Metro in Mexico City</li><li>• Trains are very busy – there are poor people begging. One man is singing and another woman is trying to sell some sort of salsa. She is carrying a small child.</li><li>• There aren't any adverts</li><li>• In the stations there are people collecting for the Red Cross. There are also mini take away Domino pizza places</li><li>• At the entrance to the subway there is a woman begging – she has a baby and a small child</li><li>• The trains are orange on the outside and have green plastic seats.</li></ul> |
|---|

### 6.3.3 Medium Quality Field Notes

The following is an example judged to have a medium quality. It offered a good amount of description without slipping into speculation. The language used gives a good sense of what it is like to be in the space with colourful descriptive terms such as “canoodling”. The level of detail is sometimes a little vague, for example, it states there are “10 people sitting in my area” but it is difficult to be certain what “my area” actually means. The note then states “more standing around”, and again “more” is a loose term so it is hard to get a completely accurate picture from this description. The length of the observations was not stated, so it is difficult to know how long they lasted for.

LOCATION: Glasgow Central Station Concourse, I am sitting on a seat.

DESCRIPTIVES:

- Lots of people, 10 sitting in my area, far apart from each other, more standing around.
- 3 are on phones, either talking or tapping at them
- 2 are canoodling
- There is a large TV screen high up next to the departures board showing adverts and news.
- Some people stand facing the departures board.
- Lots of shops and adverts about the concourse.
- Tannoy announcements of train updates.
- Many folk walking to the local platforms, ones around the national ones are generally stationary
- Some hold coffee cups, of the cardboard takeaway type.
- Baggage is left on the ground or at the side on a seat next to the owner.
- All people now are individuals rather than in a group or with friends.
- A cleaner is sweeping up around the waiting area.
- One person eats a sandwich.
- Another repacks their bag.
- Someone is jogging.

SPECULATIVE:

- I presume the jogging person is trying to catch a train.

### 6.3.4 High Quality Field Notes

The following is an example field note judged to have a high quality. It clearly used the provided framework. It contained information about the context the notes were taken in such as the date, start / finish time and observation position. The description gave a good sense of the experience of being in the space and the activity occurring, going into sufficient detail about individual observations without slipping into being speculative. Where there was any speculation,

the language used helped to indicate this. For example, “I assume she is sleepy as she is yawning and rubbing her eyes.” The field notes were submitted promptly after the stated end time indicating that the notes were written up very soon after the observations had been made.

LOCATION: Montrose train station

START TIME: 08.05 14/02/2012

FINISH TIME: 08.17 am

POSITION: I am sitting on a cold metal bench in the waiting room. It is glass on 3 sides with the ticket desk in front of me and the platform is behind me through the glass. There is an ineffective blow heater noisily blasting out very little heat.

DESCRIPTIVE NOTES:

- There are very few people in the station as the train is not due until 08.18. A woman struggles with the door – there are mixed messages on the door, one which says ‘push button to operate’ and one which instructs you to push the door itself. The button to operate the door electronically is not immediately obvious so people tend to push the door itself but it is very heavy and requires you to push your body into it to open.
- A woman struggles in through the difficult door and sits on another bench – she stares out of the window and does not occupy herself with any object – I assume she is sleepy as she is yawning and rubbing her eyes.
- People drift in and buy tickets – all for Arbroath or Dundee and I speculate that they are commuters. A woman sits next to me on the bench and starts to read a magazine.
- The train’s imminent arrival is announced but no-one moves which makes me think they have all been here before and know that the approaching train can be seen from at least a minute away.
- I am the only person in the waiting room with an electronic device as I type my scratch notes in to my phone.
- Eventually someone gets up prompting everyone to look and confirm that the train is now approaching and it is time to go out into the cold again. There is some interaction as we struggle out of the heavy door, acknowledging the task and holding it open for the next person.
- Again, it seems very quiet (as with yesterday and I remember the schools are still on holiday.)
- A passenger announcement is made asking people to take care in case the platform is slippery.
- We queue at the train doors and regular travellers stand at the same spot every day. The doors beep and as there are very few people travelling there is little jostle to board today.

Ongoing feedback and additional training could have been provided to help improve the low quality note takers. Improving field note writing skills whilst out in the field may have encouraged participants to contribute further material.

## 6.4 Follow-up Interviews on the Method

Four participants took part in follow-up interviews after the fieldwork which asked questions about participants’ prior knowledge of qualitative research, experience of the training sessions, fieldwork activities and reflections on the fieldwork material.

**Motivation.** All participants interviewed had some prior experience of conducting observations for qualitative research. A repeated occurrence was that they had tried it before on a university

course. One participant said they were interested in ethnographic research so felt involvement in the study was an opportunity to see someone else's approach to how this was done.

**Training.** Feedback on the training indicated that it was pitched at a sufficient level and quantity for what was required. One participant stated “It was well chunked - not too much and not too little.” The activity where the participants were able to try out making observations and discuss this experience as a group was also helpful. “I think we went out very well equipped for what you wanted us to do.” One participant stated they did not fully understand how the data that was contributed was going to be used. This led to concerns about knowing what to write about, “... because what's relevant and what's not?”.

**Framework & Support Materials.** The POEMS framework was continually referenced as a very useful tool to support making the observations as it was considered memorable and provided a helpful way to structure the field notes. The provided reference card was not used very much once out in the field. “I did have the card but to be honest - I mostly just used the POEMS thing because I was carrying so many books and bits of paper so trying to look it out all the time wasn't so easy.”

**Skill Development.** The participants stated they felt their observational and field note writing skills had developed as they went along by getting more practiced. For example, one participant stated that at first, there may have been issues about which categories of the framework to make observations under but then became more relaxed about labelling so felt it was not such an issue.

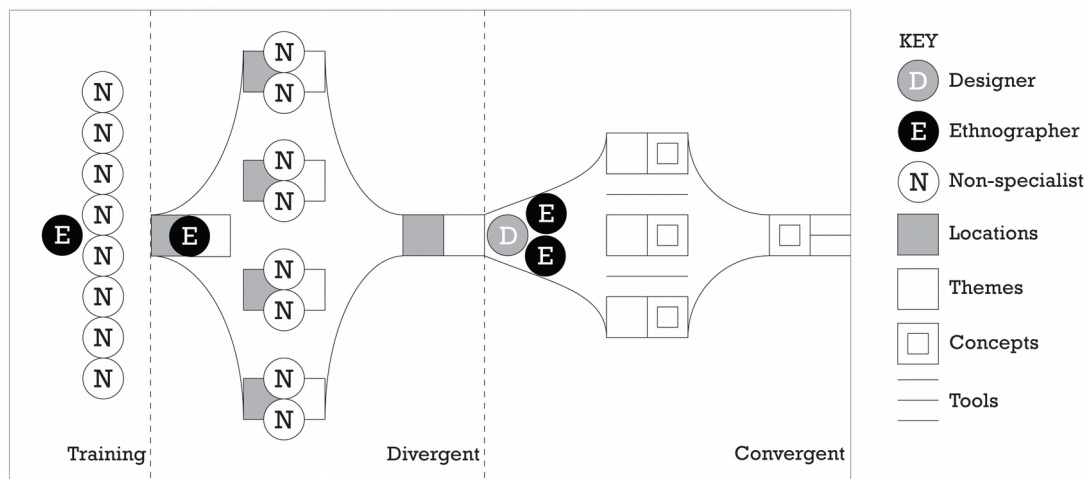
**Barriers.** When discussing any difficulties with making field notes or reasons why they were unable to contribute more, the main barrier was other work commitments. This often left little time in the transit places to make observations, as they would arrive with just enough time to board. Also, sometimes the spare moments in the transit locations had to be used for e-mailing colleagues or writing reports rather than participating in the study.

## 6.5 Conclusions on the DiCER Method and its Training Phase

The application of the DiCER method required the development of training and additional support materials to enable employees to carry out fieldwork activities in transit locations. The

training sessions provided a basic introduction to the use of ethnography in the design process and allowed the participants to try out fieldwork skills with the support of others. Only a theme, location map and simple questions were provided to the participants in the earlier iterations of the method. In this iteration, the materials were expanded to include a *template for keeping field notes* and *tips on field note recording techniques*. The additional material was necessary as it helped people who did not have any support from other teammates to make observations.

The visualisation of the method (see Fig. 28) has been extended to show the additional training phase. The section on the left shows the experienced ethnographer sitting alongside a group of eight non-specialists. This illustrates the training activity that feeds into the divergent phase where the non-specialists are allocated individual locations and themes to conduct fieldwork.



**Fig. 28.** DiCER Method: Training phase developed in this section

The coordination of the fieldworkers was different to the previous iterations of the method. The first iterations (divergent phase) involved fieldwork over a much shorter period so only required an initial briefing and regrouping halfway through to discuss any issues. The later iteration (convergent phase) was over a longer period, but was much more intense and allowed for regular communication through updates every few days. In this last study, the fieldwork took place over an even longer period, but was a lot less intense as the fieldwork was at different times according to participants' travel plans. Being dispersed in this way made it more difficult to manage the

fieldworkers as everyone had alternative travel plans, different levels of ability, willingness to participate and varying styles of communication.

Two main issues encountered related to insufficient continued participation and low quality of some of the field notes.

**Issue: Insufficient Participation.** Half the participants did not contribute any field notes during the study and some only contributed a small amount. Although this may have been because they lost interest in participating, the fact they were not prompted to send in field notes may have also been a factor. A scheduling system could be used to send reminders to the participant as they are due to contribute field notes.

The motivation for the participants to stay on board was limited as the team ethos was missing from the fieldwork within this study. The previous iterations of the method had used paired fieldworkers so there was continuous support whilst out in the field. This continuous dialogue helped people to frame what they were observing and gave many opportunities to discuss observations whilst in the field setting. In this iteration of the method, after the training, participants did not see each other again. This lack of communal support is a reason there was a significant drop-off in the number of participants. An online messaging service (e.g. Twitter) would enable sharing live stories from the field as they emerged. This openness with the gathered material may provide support and encouragement to others whilst in their respective field settings.

Another reason that limited participants' contributions was the requirement to engage in fieldwork whilst already travelling or commuting out-with their normal work hours. There are often periods of waiting around when travelling on public transport. However, during this spare time there is not necessarily a desire to engage in work related activity unless it is particularly urgent.

**Issue: Poor Quality of Some Field Notes.** Field notes varied in quality with three participants producing low quality notes. Only few notes were high quality, with many of medium quality. This was despite participants seeming satisfied with the training they had received. A follow-up activity during the training using the actual research questions could help participants to contribute higher

quality field notes. The participants also need more in-depth feedback on the notes they provide in the initial exercises, as feedback was not substantial enough for them to greatly improve their fieldwork skills when the field notes were low quality.

## 7 CONCLUSIONS AND FUTURE WORK

We have presented a new Distributed Consumer Experience Research Method (DiCER), which is based on design ethnography and is designed for applying within short time frames. An overview of the method was provided as was its aim to support the collaboration between ethnographers, designers and non-specialist fieldworkers within a large organisation. It is made up of three phases: a *training phase*, a *divergent phase* and a *convergent phase*. The *training phase* involves the recruitment and training of many potential fieldworkers who will be involved in gathering fieldwork data to inform the consumer experience research process. The *divergent phase* sets out a range of related themes and suitable locations to situate those themes for the non-specialist fieldworkers to carry out fieldwork. The *convergent phase* explores the problem defined through the earlier phase in much greater detail. This phase requires the involvement of two experienced ethnographers working closely with a designer. The outcomes of applying the method can be used to inform further consumer experience research activity and facilitate a wider appreciation of the results within a large organisation.

The DiCER Method requires a range of support materials to apply it in the context of public spaces and across a large organisation. For the *training phase* these support materials include a briefing presentation and a reference card to support making observations whilst out in the field. In the *divergent phase* the materials are a set of briefing cards with maps and themes, which are provided to different teams working at various locations. In the method's *convergent phase*, the support materials take the form of sketched maps of the location where the fieldwork is carried out and a time-lapse heat mapping technique to record observations of the space. The developed

support materials for the divergent and convergent phases are specifically suited for applying the DiCER method in a public space context, and for generating knowledge about shared experiences.

## **7.1 Reflections and Recommendations**

Co-ordinating the non-specialist fieldworkers required a great deal of planning to identify themes, locations, negotiate permissions and generate appropriate support material. This central organisation helps the fieldworkers to collaborate by giving them a structure to work within and allows them to concentrate on the key fieldwork activities of observing and recording field notes.

The expected level of depth that will be achieved from applying the DiCER method should be factored in when defining the scope of the research at the outset. In the divergent phase of the method, there is not an opportunity to engage in more visits to the field where the fieldwork protocol can be refined further. However, this can be addressed in the later convergent phase of the method where more time can be spent in the field to achieve more depth.

The collaboration between designers and ethnographers offers many opportunities for both sides to feed into each other's practice. The ethnographers provide designers with deep knowledge of people, their behaviours and contexts where any of their solutions will be used. The designers can offer ethnographers innovative techniques for observing, gathering and analysing fieldwork material. They can also turn the insights provided by the ethnographer into something tangible such as a prototype or help to visualise the generated insights for dissemination.

Visual templates of the physical spaces where the fieldwork is taking place helps give a shared format for recording observations. This means that when the analysis activity occurs, there is a good level of uniformity to the data so any patterns are easier to discern. This is an especially useful technique to apply in the divergent phase when there are multiple teams of fieldworkers working at the same location.

The value of good training for the non-specialist fieldworkers should be emphasised. High quality of interactions with the fieldworkers as they are introduced to the approach and begin to



apply the techniques in their fieldwork is crucial. A positive experience in this initial phase informs their approach to collecting fieldwork data and influences their overall impression of the method.

It was a challenge to manage the fieldworkers over a longer period rather than a shorter. Ideally, a shorter spell of more intense fieldwork is preferable for the divergent phase. There was great energy and fieldwork material generated by having a tight deadline on a single day with all fieldworkers grouped together at the start, midway through and end of the fieldwork session. In comparison, where the fieldworkers first met for the training phase but were left to go through the divergent phase in their own time over the space of a month, the results were less than expected. There was a significant drop off in those who continued to participate and the quality of the returned field notes was highly variable. Whilst the DiCER method has the key characteristic of being *distributed* over a large group of non-specialist fieldworkers, when the short bursts of fieldwork were also *distributed* over time, the results were not as convincing. When it is simply not practical to have the large group of fieldworkers participating at the same time, there are design recommendations for the method (see section 6.5) but these have yet to be implemented to evaluate their effectiveness.

## 7.2 Future Work

Firstly, we plan to apply the DiCER method within an industry partner, to evaluate the method on a real world problem using a group of employees across a large corporation as participant fieldworkers. This would also develop the method further by addressing the suggested design recommendations where the study was deployed with university staff. This included timely reminders to contribute field notes, further incentives to prompt participation and encouraging collaboration amongst employees throughout the study. Additionally, we plan to investigate the effect of extending the training from two hours to two days.

Secondly, we aim to develop and investigate the impact of providing a mobile application to support the fieldworkers whilst they make observations and gather field data. This would offer a combination of the support material provided at the outset of the framework with additional media

collecting and tagging tools. This would allow the fieldworker to begin the first stage of analysis through tagging and organising material whilst in-situ rather than having to sift through a huge range of unsorted material later on. This could also provide support for the fieldworkers to communicate the observations they have made with each other whilst in the field.

Thirdly, we plan to develop and investigate the impact of providing a tool to support the ethnographer who is tasked with co-ordinating the large group of fieldworkers potentially distributed across many different locations. This tool would help keep track of the fieldworkers and collate the material they have contributed. The tracking facility could help to monitor who has already sent in their fieldwork material along with who is scheduled to make a contribution but has failed to do so. This would help to flag up the individuals who are struggling with the tasks they have been allocated and prompt for additional support to be provided. The co-ordinator's tool could connect with the fieldworker support tool discussed above to begin analysing the data they have collected and help focus the observations further through additional research questions.

**Acknowledgements.** This research was funded by NCR and the Northern Research Partnership.

## REFERENCES

- Agar, Michael H. 1996. "The Professional Stranger: An Informal Introduction to Ethnography."
- Beyer, Hugh. 1998. *Contextual Design: Defining Customer-Centered Systems*. San Francisco Calif.: Morgan Kaufmann.
- Beyer, Hugh, Karen Holtzblatt, and Lisa Baker. 2004. "An Agile Customer-Centered Method: Rapid Contextual Design."
- Bowman-Kruhm, Mary. 2003. *Margaret Mead: A Biography*. Greenwood Publishing Group.
- Buchenau, Marion, and Jane Fulton Suri. 2000. "Experience Prototyping." In *Proceedings of the 3rd Conference on Designing Interactive Systems: Processes, Practices, Methods, and Techniques*, 424–33. New York City, New York, USA: ACM.
- Calder, Bobby J. 1977. "Focus Groups and the Nature of Qualitative Marketing Research." *Journal of Marketing Research*, 353–64.

- Chamberlain, Alan, Andy Crabtree, and Mark Davies. 2013. "Community Engagement for Research: Contextual Design in Rural CSCW System Development." In *Proceedings of the 6th International Conference on Communities and Technologies*, 131–39. ACM.
- Crabtree, Andy, Steve Benford, Chris Greenhalgh, Paul Tennent, Matthew Chalmers, and Barry Brown. 2006. "Supporting Ethnographic Studies of Ubiquitous Computing in the Wild." In *Proceedings of the 6th Conference on Designing Interactive Systems*, 60–69. ACM.
- Dalsgaard, Peter, Christian Dindler, and Kim Halskov. 2011. "Understanding the Dynamics of Engaging Interaction in Public Spaces." In *Human-Computer Interaction – INTERACT 2011*, edited by Pedro Campos, Nicholas Graham, Joaquim Jorge, Nuno Nunes, Philippe Palanque, and Marco Winckler, 6947:212–29. Lecture Notes in Computer Science. Springer.
- Davey, Caroline L., Andrew B. Wootton, and Mike P. Press. 2012. *Design Against Crime*. Ashgate.
- Day, Phil N., Graham I. Johnson, Charlie Rohan, Chris Riley, and Maggie Carlisle. 2010. "User Experience at NCR: An Organisational Overview." In .
- Deutskens, Elisabeth, Ko De Ruyter, Martin Wetzels, and Paul Oosterveld. 2004. "Response Rate and Response Quality of Internet-Based Surveys: An Experimental Study." *Marketing Letters* 15 (1): 21–36.
- Emerson, R. M., R. I. Fretz, and L. L. Shaw. 2011. *Writing Ethnographic Fieldnotes*. University of Chicago Press.
- Euchner, James, and Austin Henderson. 2011. "The Practice of Innovation: Innovation as the Management of Constraints." *Research-Technology Management* 54 (2): 47–54.
- Evans, Joel R., and Anil Mathur. 2005. "The Value of Online Surveys." *Internet Research* 15 (2): 195–219.
- Fern, Edward F. 1982. "The Use of Focus Groups for Idea Generation: The Effects of Group Size, Acquaintanceship, and Moderator on Response Quantity and Quality." *Journal of Marketing Research*, 1–13.
- Frohlich, D. M, and G. Prabhu. 2003. "Fueling the Ethnographic Imagination by Design." *Contextual Invention: Creative Approaches to Innovation in Emerging Markets*, 39–59.
- Gaver, Bill, Tony Dunne, and Elena Pacenti. 1999. "Design: Cultural Probes." *Interactions* 6 (1): 21–29.
- Grudin, Jonathan. 1993. "Obstacles to Participatory Design in Large Product Development Organizations." *Participatory Design: Principles and Practices*, 99–119.
- Hammersley, Martyn, and Paul Atkinson. 2007. *Ethnography: Principles in Practice*. Routledge.
- Hanington, Bruce. 2003. "Methods in the Making: A Perspective on the State of Human Research in Design." *Design Issues* 19 (4): 9–18.

- Hassenzahl, Marc. 2008. "User Experience (UX): Towards an Experiential Perspective on Product Quality." In *Proceedings of the 20th International Conference of the Association Francophone d'Interaction Homme-Machine*, 11–15. ACM.
- Hughes, John A., Dave Randall, and Dan Shapiro. 1992. "From Ethnographic Record to System Design." *Computer Supported Cooperative Work (CSCW)* 1 (3): 123–41.
- Hunt, Jamer. 2011. "Prototyping the Social: Temporality and Speculative Futures at the Intersection of Design and Culture." In *Design Anthropology*, 33–44. Springer.
- Johnson, Steven. 2010. *Where Good Ideas Come from*. London: Allen Lane.
- Kanuk, Leslie, and Conrad Berenson. 1975. "Mail Surveys and Response Rates: A Literature Review." *Journal of Marketing Research*, 440–53.
- Klanten, Robert, and Matthias Hubner. 2010. *Urban Interventions: Personal Projects in Public Spaces*. Gestalten.
- Krueger, Richard A. 2009. *Focus Groups: A Practical Guide for Applied Research*. Sage.
- Kumar, Vijay, and Patrick Whitney. 2003. "Faster, Cheaper, Deeper User Research." *Design Management Journal (Former Series)* 14 (2): 50–57. doi:10.1111/j.1948-7169.2003.tb00041.x.
- Laurel, Brenda. 2003. *Design Research: Methods and Perspectives*. Cambridge Mass.: MIT Press.
- Leinbach, Charles. 2002. "Managing for Breakthroughs: A View from Industrial Design." *Creating Breakthrough Ideas: The Collaboration of Anthropologists and Designers in the Product Development Industry*. S. Squires and B. Byrne. Westport, CT, Bergin & Garvey, 3–16.
- Lincoln, Yvonna S. 1985. *Naturalistic Inquiry*. Vol. 75. Sage.
- Linsky, Arnold S. 1975. "Stimulating Responses to Mailed Questionnaires: A Review." *Public Opinion Quarterly* 39 (1): 82–101.
- Litosseliti, Lia. 2003. *Using Focus Groups in Research*. Continuum International Publishing Group.
- McCarthy, John, and Peter Wright. 2004. "Technology as Experience." *Interactions* 11 (5): 42–43.
- Miles, Malcolm, and Tim Hall. 2005. *Interventions: Advances in Art and Urban Futures*. Intellect Books.
- Millen, David R. 2000. "Rapid Ethnography: Time Deepening Strategies for HCI Field Research." In *DIS '00: Proceedings of the 3rd Conference on Designing Interactive Systems*, 280–86. New York, NY, USA: ACM. doi:http://doi.acm.org/10.1145/347642.347763.
- Muller, Michael J. 2003. "Participatory Design: The Third Space in HCI." *Human-Computer Interaction: Development Process*, 165–85.
- Nicolescu, Basarab. 2010. "Methodology of Transdisciplinarity—levels of Reality, Logic of the Included Middle and Complexity." *Transdisciplinary Journal of Engineering & Science* 1 (1): 19–38.

- Nielsen, Jakob. 1997. "The Use and Misuse of Focus Groups." *Software, IEEE* 14 (1): 94–95.
- Press, Mike, and Rachel Cooper. 2003. *The Design Experience: The Role of Design and Designers in the Twenty-First Century*. Ashgate Publishing, Ltd.
- Putnam, Robert D. 1995. "Bowling Alone: America's Declining Social Capital." *Journal of Democracy* 6 (1): 65–78.
- Rothstein, Paul. 2003. "A (x4): A User-Centered Method for Designing Experience." *ADVANCES IN CONSUMER RESEARCH, VOL 30* 30: 354–354.
- Salvador, Tony, Genevieve Bell, and Ken Anderson. 1999. "Design Ethnography." *Design Management Journal (Former Series)* 10 (4): 35–41. <http://dx.doi.org/10.1111/j.1948-7169.1999.tb00274.x>.
- Sanders, E. B. N. 2002. "Scaffolds for Experiencing in the New Design Space." *Information Design*.
- Sanjek, R. 1990. *Fieldnotes: The Makings of Anthropology*. Cornell University Press.
- Seeburger, Jan, Marcus Foth, and Dian Tjondronegoro. 2012. "The Sound of Music: Sharing Song Selections between Collocated Strangers in Public Urban Places." In *Proceedings of the 11th International Conference on Mobile and Ubiquitous Multimedia*, 34. ACM.
- Shoben, Andrew. 2009. *In the City*. [S.l.]: Greyworld Pub.
- Simonsen, Jesper, and Finn Kensing. 1997. "Using Ethnography in Contextual Design." *Commun. ACM* 40 (7): 82–88.
- Sleeswijk Visser, Froukje, Remko Van der Lugt, and Pieter Jan Stappers. 2007. "Sharing User Experiences in the Product Innovation Process: Participatory Design Needs Participatory Communication." *Creativity and Innovation Management* 16 (1): 35–45.
- Smithson, Janet. 2000. "Using and Analysing Focus Groups: Limitations and Possibilities." *International Journal of Social Research Methodology* 3 (2): 103–19. doi:10.1080/136455700405172.
- Smyth, Michael, and Ingi Helgason. 2010. "Informing the Design of the Future Urban Landscape." In *Proceedings of the 8th ACM Conference on Designing Interactive Systems*, 438–39. ACM.
- Sotirin, Patty. 1999. "Bringing the Outside In: Ethnography In/beyond the Classroom."
- Spradley, James P. 1979. "The Ethnographic Interview."
- Strauss, Anselm. 1998. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*. 2nd ed. Thousand Oaks CA: Sage Publications.
- Suri, JaneFulton. 2011. "Poetic Observation: What Designers Make of What They See." In *Design Anthropology*, edited by AlisonJ. Clarke, 16–32. Edition Angewandte. Springer Vienna. [http://dx.doi.org/10.1007/978-3-7091-0234-3\\_2](http://dx.doi.org/10.1007/978-3-7091-0234-3_2).

- Trucco, Emanuele. 1998. *Introductory Techniques for 3-D Computer Vision*. Upper Saddle River, NJ: Prentice Hall.
- Von Hippel, E, and R Katz. 2002. "Shifting Innovation to Users via Toolkits." *Management Science* 48 (7): 821–33.
- Von Hippel, Eric. 1989. "New Product Ideas from Lead Users." *Research Technology Management* 32 (3): 24–27.
- Wasson, Christina. 2000. "Ethnography in the Field of Design." *Human Organization* 59 (4): 377–88. <http://sfaa.metapress.com/content/H13326628N127516>.
- Wiethoff, Alexander, and Sven Gehring. 2012. "Designing Interaction with Media Façades: A Case Study." In *Proceedings of the Designing Interactive Systems Conference*, 308–17. ACM.
- Wiseman. 2009. "It Moved Me: The Statue of David Hume on the Royal Mile." *The Sunday Times*. March 29. [http://www.thesundaytimes.co.uk/sto/news/uk\\_news/article158147.ece](http://www.thesundaytimes.co.uk/sto/news/uk_news/article158147.ece).
- Wood, Larry E. 1997. "Semi-Structured Interviewing for User-Centered Design." *Interactions* 4 (2): 48–61.
- Zeisel, John. 1979. *Inquiry by Design: Environment Behavior Neuroscience in Architecture, Interiors, Landscape, and Planning*. Rev. ed. New York: W.W. Norton & Company.